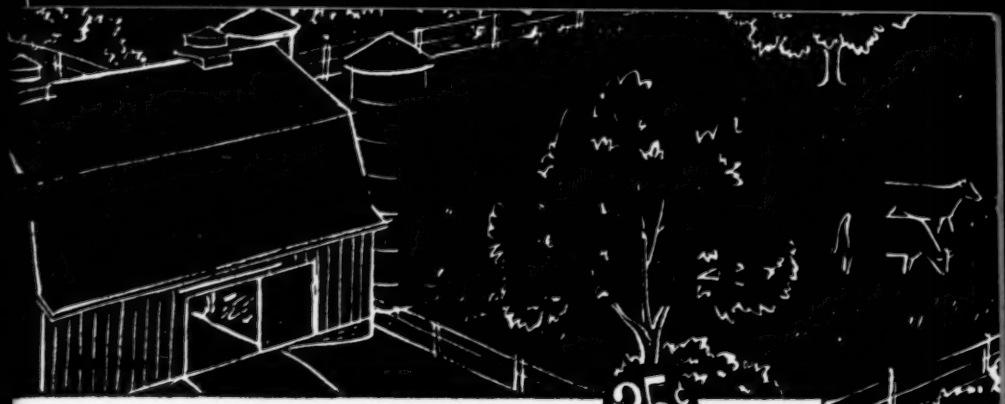

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THE FARMER'S DIGEST

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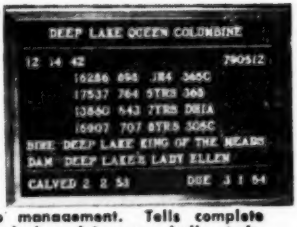
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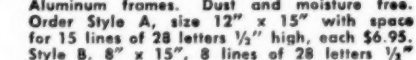

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The **Farmer's Digest**

Volume 21 May 1957 Number 1

The Revolutionary New Livestock Feeding Contracts

If you are not informed about a new trend in farm financing, you should be. It may change your operations completely . . .

Condensed from
Doane Agricultural Digest

POWER machinery and pole-type farm buildings are symbols of postwar farm progress. But an equally *revolutionary development in farm financing has slipped by almost unnoticed.* In some areas this development has already reduced the cash requirements of farm operators and made it possible to get started in farming without going deep in debt. We are referring to the new "feed contracts" being sponsored by feed companies and dealers. Many people look on these contracts as just another way to sell feed. Our research shows that *they are in fact a new way of financing farm operations.*

The Broiler Contracts

Most Midwest farmers will be surprised to learn that more than 90% of all broilers are grown under some sort of feed contract. Instead of borrowing money to finance his own operation, the broiler grower just gets a contract. Usually he furnishes the buildings and does the work (but not always). The feedman furnishes the chicks, feed and medicine. In addition, the feedman arranges for the sale of the birds, does all bookkeeping and absorbs the loss if the income from sale

Reprinted by permission from Doane Agricultural Digest, published by Doane Agricultural Service, St. Louis 8, Missouri

of the birds doesn't pay all cash costs.

The impact of this new financing arrangement upon agriculture is so great that it may completely revolutionize the production of animal products. It has already changed fryer production. Contracting is now common practice among turkey growers. Egg producers are making a start in this direction. At least one feed company is experimenting with hog contracts. And some of the commercial cattle feeding operations are out and out contract setups with the operator not owning a single head of livestock.

Two basic types of feed or production contracts are in common use at the present time in the broiler producing areas:

1. *Guaranteed minimum sale price*—under this type of contract, the farmer knows the minimum sale price he'll get for the products he hopes to sell before he starts out. It's up to him to keep his costs below that level. If the money received fails to cover expenses, the feedman who is financing the contract usually absorbs the loss. If the loss is due to neglect on the part of the farmer, the contract is not renewed. When prices go above the guarantee, the feedman and the farmer split the extra money.

2. *Flat rate or guarantee margin*—under this plan the farmer assumes no risks and gets paid on a piecework basis—so much per pound, per head or per unit of product. *This plan is very similar to the wages paid a production worker in a factory.* He does not have to invest a penny in the business to draw his pay check. If the feedman makes money and the farmer does a good job, he can stay on the payroll indefinitely.

The flat rate contract is often modified with a feed conversion and mortality clause which pays more if feed requirements are held below certain levels. The feedman uses this as a means of sharing profits with farmers who do a better than average job. Some of the newer feed contracts are called "combinations" because they include some of the better features from each of the above plans. *More and more it is the terms of the contract that count.* Actual market price of the finished product becomes less and less a factor in planning the farm operation.

Changing Agriculture

Production contracts such as these did not just happen. They are the product of more than 20 years of try and try again financing of broiler producers. In the process, the economics of poultry farming have been changed completely. Twenty years ago, poultry was an important sideline on nearly every farm in the Midwest, and farm fryers were pro-

duced as a by-product of this operation.

Most everyone pooh-poohed the idea of commercial broilers back in 1920. Corn Belt farmers had a corner on the nation's feed supply and knew it. Besides, Mrs. Farmer had free access to the corn crib, and never thought of charging her time against the chickens. The sale of eggs and fryers was a major source of spending money for the farm wife and children. Against this background a man would have been crazy indeed to say that farmers in Georgia or in Del-Mar-Va could buy everything (including commercially-mixed feed that had come all the way from Iowa or Illinois) and put the Midwest out of the poultry business, but what happened—

A story is told of a young man who called one evening on a rich old farmer to learn the farmer's story of how he became rich.

"It's a long story," said the old man; "and while I'm telling it, we might as well save the candle." And he blew it out.

"You need not go on," interrupted the youth; "I understand."

Today the farm fryer is almost as rare as the whooping crane. In some areas there is no market outlet for fryers except at roadside stands. Moreover, the *consumption of young chicken has tripled since 1940. Last year alone broiler production climbed almost 20%* and there will be still more in 1957. Fried chicken used to be a high-priced seasonal product that was reserved for special occasions. Now, fried chicken is a food staple for everyday eating and has taken a regular place on the menu beside beef and pork.

Feed contracts for the production of poultry and other livestock are not available everywhere but they are coming in fast. More and more feed companies are offering contracts over a wider and wider area. *From a farmer's point of view the contracts provide one possible answer to the high risks and climbing capital requirements of getting into livestock production. The time is approaching when most agricultural products will be produced under contracts of one kind or another.*

Contracts Are Not New

Contracting as such is not new to farmers. *Agriculture has been moving in that direction for a long time.* Private business, cooperatives and the Federal Government are all in on the act. The milk marketing agreements around every major city are a form of contract. Most canning crops, such as sweet corn, peas, green beans and tomatoes, are grown under contract to a can-

ning company. Sugar beets cannot be sold without a contract. The big fruit grower associations are cooperative and allow only those farmers to sell who have a contract.

The government price support programs for farm commodities are another form of contracting. They offer a guaranteed minimum price. *The big fuss in Washington over the farm program is really about terms of the contract.* To the extent that the government becomes involved in contracting, the risks of providing food in abundance is shifted from 2 or 3 million farmers to 170,000,000 American consumers.

When risks of production are shifted to someone else, freedom of action goes with them. A farmer who borrowed from his banker on an open account found few strings attached. But *when he gets a contract he does things the way others tell him.* Some of the new egg contracts, for example, tell exactly how to build the laying house, what feeds to use, how much to feed and when to gather the eggs.

Old freedoms go, whether it is private business, cooperatives or the government that holds the contract. The farmer co-ops tell their members whether to ship or to destroy a crop. The Federal Government has power to impose fines upon those who sign up under the price support and Soil Bank programs but fail to live up to their agreement.

Source of Funds

Typically, the feed contracts are financed by local bankers. Here is how they work. Instead of the banker making small loans to many farmers, he makes one big loan to the feedman. This arrangement costs the banker a lot less per $100 loaned, and the farmer gets to use the money just the same. The cost of such credit is counted as operating expense. *It does not get charged to the farmer unless he makes some money.* The feedman absorbs the losses.

The cost of looking after a loan of $50,000 or even $100,000 made to a local feedman is often less than that required for a small loan made to a farmer who lives several miles out in the country. This difference in cost explains most of the difference in interest rates. The feedman with the backing of the feed manufacturer qualifies for just about the lowest interest rate available anywhere.

Other Contracts

Contracts are being considered in other ways, too. The business machine people rent their equipment to even the largest businesses. One of the reasons is that new machines that do the job better or faster keep coming out. No business can survive for long if its competitor has a way of

doing the same job for less money.

Farmers are asking if the same ideas apply to farm machines. *We expect to see many local machinery dealers accept this challenge. The credit setup at the local bank will be similar to that for the feedman.* As this comes about, another step to reduce high costs and financial risks of farming will have been made.

With income taxes as they are, *some farmers find it to their advantage to rent or lease machinery. This way the entire annual operating cost of the machine is charged off against farm income in the same year the crop is produced.*

Studies also indicate that contracts can help bridge the gap between farmers who are approaching retirement and young men anxious to start. *With a contract, it is no longer necessary for a farmer to sell out when he gets ready to retire. A young man doesn't have to have thousands of dollars saved up to start.*

(See article "Is The Hog Business Headed for a Shake-up?" in this issue for more information about new feed contract farming.)

Planned Forestry Work Aids Farm Income

A well-managed woodland can give a big boost to a farmer's income and make good use of his spare time in winter.

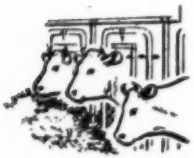
Quentin Daigle in Itasca county, Minnesota, has harvested $1,500 worth of pulpwood and sawlogs from an 80-acre forest tract since 1951. His only investment, other than his own labor, was for a chain saw.

Nine years ago, Daigle was looking for ways to make better use of his wooded area. He had a mixture of jack pine, Norway pine, aspen saplings and brush that he knew could bring a regular income, if managed right.

Daigle talked his situation over with Floyd Colburn, Itasca county forestry agent. Colburn helped Daigle set up a complete woodland management plan, and gave him these tips. "Pick out the trees with fire scars, split butts, and other defects and cut them. By removing them now, they'll bring a profit and you'll leave more growing room for the younger trees."

The forest business should be even better for Daigle in future years. During the past three years, he has planted some 15,000 Norway pine trees. In a few years, he'll receive a good dividend from this investment; thinnings from the plantation will make fine Christmas trees. —*University Farm and Home News*

Young Cows Are Often Underfed



Young dairy cows need feed for continued growth as well as production . . .

Condensed from Hoard's Dairyman

N. N. Allen

TODAY we have a heifer ready to freshen. We have been feeding her well because we know that it is important that she should grow rapidly and reach a good size before coming into milk.

Tomorrow she freshens and joins the milking herd. We know that she must now be fed enough nutrients to maintain her body and to provide the building material for the milk she produces. But too often we forget that she is still just as much a growing heifer as she was before she calved.

Let's suppose she is a 2-year-old Holstein. She will probably weigh about 1,100 pounds. As she continues developing into an adult cow, she should grow at the rate of about a third to a half of a pound per day, even though she is milking.

With her second calf, she should gain from a fourth to a third of a pound daily, and even with her third calf she must do from a pound to a pound and a half of growing per week. She is not fully grown until she is 5 years or older.

Most dairymen follow some simple thumb rule for the amount of grain the cows get. These rules are based on the amount of milk the cow gives. They fit the needs of the mature cows pretty closely, but do not take care of the needs for growth of the young milkers.

Take a look at your own herd. How many of the milkers are under 5 years of age?

If Growth is Forgotten

In most herds we will find that the growing animals make up over half of those milked. Consequently, if we forget to allow for growth in our feeding plan, a good share of the herd will be underfed.

Suppose we feed a heifer just enough to maintain her body and to furnish the nutrients needed for her milk production, and forget her growth needs. Will she stop growing? No, she will not stop growing; she will compromise by growing more slowly than

Reprinted by permission from Hoard's Dairyman, Fort Atkinson, Wisconsin

she should, but she will grow.

Where will she get the nutrients for even this reduced growth? She will compromise in her milk production, too, cutting down enough to make up for the feed that goes into the growth.

These heifers will probably dry off sooner than they should, and they may pick up some of the growth while dry. Also, an animal that is not fed enough to grow normally will partially compensate by continuing to grow to a greater age, and she may eventually become just as big a cow as if she had been fed better. Meanwhile, however, she has not been producing milk as profitably as if she had been fed to take care of her full needs. The extra feed allowed her for growth will usually pay dividends in the milk pail.

The Nile Valley level now is seven feet higher than in the time of Cleopatra as a result of silt brought down from African highlands.

We might feed a heifer so that her frame grows to her full capacity for growing by feeding a ration well balanced with energy, protein, and minerals in just the right amount. By feeding still more of the same feed, her daily gain would increase, but the added gain would be fat.

Heifers should be kept in good, thrifty condition, but nothing is gained by trying to keep them in too high condition. Too much fat may actually interfere with the normal development of the udder and reduce the milk production. We seldom find a herd where the young cows are fed too much. But we can get good milk production and still keep them growing. Good roughages can contribute a large share of the nutrients, but the growing cows will need a heavier allowance of grain to help out as compared to the mature cows.

Allow for Growth Needs

This does not mean that we must abandon the thumb rules which are so helpful in planning the feeding of the grain. They can still be the starting point.

We know that they have to be backed up by some judgment and cow sense, even for the mature animals, since individual cows differ in their needs. Also, some cows can handle larger amounts of roughage than others, which means they will not need as much grain.

For a 2-year-old of the larger breeds, four to five pounds of extra feed is needed to allow for good growth. A 3-year-old needs three to four pounds, and a 4-year-old needs two to three

pounds. The smaller breeds will need about a pound a day less than these amounts as extra grain allowance for extra growth.

If the roughages are of very high quality, it will not take as much grain. A good herdsman will watch the heifers closely. He can tell when they are coming along properly and growing as they should, and he will shade the grain allowance accordingly.

Young cows can grow well and produce well at the same time, but they cannot do it unless they are well fed. In too many cases, they struggle along on scanty feeding, trying to grow and trying to milk, but unable to do a good job of either.

New Wisconsin Canning Pea Varieties

Two new disease resistant canning pea varieties have been released by the University of Wisconsin.

They are New Wales and New Season. Both are resistant to three serious pea diseases in Wisconsin—wilt, near wilt and bean virus 2 mosaic. D. J. Hagedorn, University plant breeder who developed the new varieties, says seed was offered for sale to growers this March.

While the varieties can be used for commercial production right now, Hagedorn thinks their most significant contribution will be as sources of new germ plasm for breeding new disease resistant varieties.

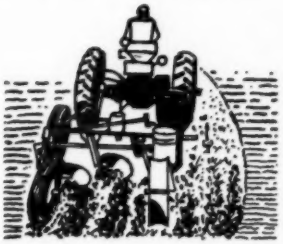
New Wales produces a large, oval pea and matures in about 69 days. Its disease resistance makes it a better yielder than Perfected Wales, a variety now grown widely in the state and one of the ancestors in the new variety's pedigree. It is very good in canning quality—comparable to Perfected Wales.

Growers will like New Wales because of its disease resistance and shorter vine length. Its only weakness seems to be a tendency to produce rogues—plants which are not true to type.

New Season peas are round and small. The variety's yielding ability is very good and its canning quality is acceptable. It's an early variety of the Early Perfection type of canning pea, maturing in about 61 days with short vines and a good number of double pods. The ancestors in its pedigree are Loyalty and Delwiche Commando.

—University of Wisconsin

Plow Land, Plant Corn in One Operation



Here's least-cost corn production. An Illinois farmer cut field work 62% . . .

Condensed from Successful Farming

Professor S. R. Aldrich, Cornell University

VERNON Veatch, Ford County, Illinois, had some eye-opening results last year with plow-plant—one of the extreme methods of minimum tillage.

He plowed down 3-year alfalfa-brome sod and planted one row of corn at the same time. (The planter is mounted on the plow, as illustrated above.) He cultivated his corn once, and picked it. That was all! He went over this field only 3 times. Compare this with the usual 8 trips made over a field to plant and harvest it in the conventional manner.

The pay-off for any new planting method is in the yield of the crop. University of Illinois men hand-picked 8 small plots in the plow-plant area and 8 in the area where Vernon prepared the usual seedbed. They found 7 bushels more corn per acre were produced on the usual seedbed.

However, when Vernon and his son measured off ½ acre in each field with a tape, then picked and weighed the corn, they found the conventional field made 92 bushels per acre and the plow-plant made 98; 6 more bushels of corn grown with a lot less work.

Suppose the two areas had yielded the same. How much did it cost to go over every acre 5 extra times?

Here is what Vernon says about the method: "I'm sure you have gathered that I am very enthusiastic about this experiment and plan to plant at least a small acreage in 1957. I think I have my farm in condiiton where this method of planting corn might be a big advantage.

"I started out 10 years ago to develop good soil tilth. To do this we used a 4-year rotation with 2 years of alfalfa and lots of barnyard manure. We also went to spring plowing to cut down soil losses from rains and winds. But I found that moisture stayed in the plow layer and didn't go down like it should. This kept

Reprinted by permission from Successful Farming, Des Moines, Iowa

the surface wet after heavy rains.

"Now, I believe this plow-plant method will overcome the situation. The heavy rains will soak down into the subsoil and leave the plow layer dry enough to work. I think that in times of dry weather we should find a definite advantage for plow-plant because of the extra moisture in the subsoil."

The plow-plant method was developed by Prof. R. B. Musgrave, now at Cornell University in New York. It was introduced into the Cornbelt last year by S. R. Aldrich, agronomist, and Wendell Bowers, agricultural engineer, of the University of Illinois. They planted 8 trials in central Illinois last year. Some were on sod; others on corn stubble. Soils ranged from deep, dark prairie to low-organic-matter forest soils and the difficult-to-handle gray prairie soils typical of parts of southern Illinois, Indiana, and Ohio, and northern Missouri.

Plow-plant gave top yields over usual planting methods in 4 trials besides Vernon Veatch's.

	Plow-plant	*Usual method*
	bu.	bu.
Dale Dunteman	139	129
Raymond Haynes	89	121
Frank Boon	99	111
Ray Dehority	106	
Clayton Rogers	93	85
William Malone	73	68
Ted Freeman	69	61

The results on Raymond Haynes' farm need further comment. The field plowed up sticky and cloddy and was unsuited to the plow-plant method. The stand was poor, only 9,600 plants compared to 13,300 on the rest of the field.

This experience emphasized one important lesson in plow-planting. It won't work unless a good job of plowing is done and the planter unit produces plenty of fine soil material in the row. Fine material is needed to give good seed-soil contact for quick germination in case of dry weather after planting.

Darl Fike, the farm adviser in Henry County, Illinois, is a leader in trying new things with his farmers. He took one look at the design of the equipment for plow-plant and went back to Henry County and made his own setup. He went one step further. He mounted weed spray equipment on the plow. With this he not only plowed and planted, but applied a pre-emergence weed spray at the same time. Here is what Fike says about his farm trials in 1956:

"We planted 8 plots. One plot was lost due to soil insects and another plot was discontinued because of unfavorable planting conditions. This plot was second-year bromegrass and plowing was practically impossible. We harvested 5 fields for comparisons:

plow-plant was tops in 2 and conventional tops in 3.

"Our pre-emergence spraying was very successful. We had 2 plots which were treated with the pre-emergence spray that were not cultivated at all.

"At present, it seems to me that if grass is *not* a problem in a field, cultivation can be entirely eliminated with the plow-plant method. If grass *is* a problem in a field, it seems to me that with the plow-plant method incorporating pre-emergence spraying, one cultivation in addition to the pre-emergence spraying is all that will be necessary under most conditions," Fike concludes.

A canny Maine farmer, who made it a rule to think before speaking, was approached by a stranger one day and asked, "How much is that prize Jersey heifer of yours worth?"

The farmer thought a moment, then asked, "Are you the tax assessor, or has she been killed by a train?"

—From Coronet

Advantages and Disadvantages

Here is a summary of the most important advantages and disadvantages of the plow-plant method based on 50 farm trials and experiment station research:

Advantages: 1. It saves labor.

2. It cuts down soil packing.

3. Water enters the soil rapidly, thus storing more water for use by plants during summer drouth.

4. Erosion is less because the surface is loose and open and there are no tracks for water to channel in and run downhill.

5. The weed problem is less. The soil surface is too coarse for annuals to germinate well; the rootstocks of perennials like quackgrass are not c a r e f u l l y "transplanted" as they are in a well-fitted seedbed of well-packed soil particles. Both fields on the Veatch farm were planted on May 18. The plow-plant field was not cultivated until along about lay-by time. Veatch was actually afraid this field would soak up so much water, if heavy rains came, that he could not get in to cultivate it at all!

Disadvantages: 1. Plow-plant works well only on soils in good tilth. Otherwise, there will not be enough fine, loose soil to make a good seedbed in the row.

2. It is a 1-row planting operation with a 3-bottom plow and a 2-row operation with a 5- or 6-bottom plow. This raises two important questions in the minds of farmers.

First, do you have to cultivate 1 row at a time? The answer is "no." On level fields most farmers were able to cultivate 4 rows

as usual. On sloping or strip-cropped fields, 2 rows can be cultivated at a time.

Second, isn't plow-plant too slow? The answer is "yes" if it is compared to a system where the plowing is done in the fall or early spring. But, if plowing is delayed until May by wet weather, a farmer could likely get his corn planted sooner with two tractors plow-planting than he could with one plowing and the other discing, harrowing, and planting. Here is the way a thinking farmer, Vernon Veatch, looks at it:

"Regarding the number of acres one might plant in a day, 2 acres an hour is not uncommon for a 3-bottom plow. I see no reason why that could not be done with the plow-planter. One man could hardly double-disc, harrow, and plant that much per hour even if the field had already been plowed."

A further point to consider is that a light shower of even ½ inch will stop planting on a prepared seedbed but not with the plow-plant method.

Keeping cover on fields until spring will cut down erosion losses. Sod crops will pump out soil moisture; in a wet year this is beneficial, in a dry year it becomes a disadvantage.

Plow-planting equipment is a development of self-contained unit planters now on the market. If minimum tillage methods of raising corn appeal to you, here's one you might like to try.

Contour Farming Pays

Sloping or rough fields need not prevent high crop yields, according to R. O. Cole, Purdue University extension conservationist.

Cole says high yields can be obtained from sloping land if it is farmed on the contour. When land is farmed on the contour it is worked "cross slope" and all points in each row are at the same elevation.

Corn yields on rolling land can be increased 5-10 bushels, wheat and oats 4-6 bushels, and soybeans 2-3 bushels per acre, if sloping land is farmed on the contour, Cole asserts.

Contour farming not only increases production but saves top soil and fertility and cuts down on machinery and fuel costs. If an eight per cent slope is farmed on the contour, 10 per cent more land can be worked with 10 per cent less fuel, the specialist pointed out.

—Farm News

Is the Hog Business Headed for a Shake-Up?

New pig parlor idea and feed dealer financing is taking pork production out of the corn belt . . .

Condensed from Farm Journal

SOME QUESTIONS TO PONDER . . .

Is the Corn Belt's near monopoly on hogs about to be broken? The broiler business went South because of the mild climate (cheaper housing) and abundant labor. Now the South dominates broiler-growing simply because it can produce for less. Why can't the same thing happen to hogs? Will the South, and for that matter the East and West, become self-sufficient in pork? Might they go farther and ship cheap hogs to the rest of the country?

Will some people in the Corn Belt "want in" on this hog deal? What about farmers who lack capital? Young men? Part-time farmers? It would take less time, money and know-how than hogs have taken up to now.

WILL hog farmers someday be just hired men who furnish the buildings and feed the pigs while feed dealers furnish everything else — pigs, feed and most of the decisions on running the business?

It's being tried, largely in the South. The deals vary all the way from the extreme ones just described to others where farmers still furnish everything, but buy the feed on credit. They pay for it when the hogs are sold.

It's all part of a trend in agriculture which relieves farmers of part of the investment, part of the risk and part of the control of their business. The broiler business is now run almost entirely that way. Hundreds of farmers are now producing eggs this way (see the article entitled "The Revolutionary New Feed Contracts" in this issue). Will the hog business be next?

Maybe not. But take a look at what's happening in the South where at least 2,000 farmers, many who never had a pig on the place, are suddenly cranking out pork by the carload. Now the

Reprinted by permission from Farm Journal, Philadelphia, Pennsylvania

idea is spreading into the Corn Belt.

O. C. Daily of Blount County, Ala. has one type of deal. Daily furnishes the feeding place. In his case it's part of the vacant broiler house he converted by pouring concrete floors and putting in self-feeders and automatic waterers.

His feed dealer delivers vaccinated weaner pigs to the farm, then fills the self-feeders every week. And one of his servicemen comes around once a week to check on how the pigs are doing. The dealer pays for all medicines and veterinary bills. Daily keeps the pens clean, sees that the feeders and waterers are working. He may have to hoist an occasional bag of feed should the feeders "run dry" between stops of the feed truck, but he still figures it takes less than an hour a day to tend the 120 hogs he has on hand.

The feed dealer pays Daily two cents for each pound of gain the pigs make while they're on his farm. The present batch will probably grow about 150 pounds each while he has 'em, so Daily's take will be about $3 a head.

He's so satisfied with the deal that right now he's converting the rest of his broiler house into pig-feeding pens.

"With four batches a year, that'll give me a thousand head turnover," Daily explains. "That's $3,000 gross income with very little work or investment."

Another Alabama farmer had a different view: "These guaranteed-profit deals are full of holes. After getting burned on broilers, these feed boys are writing 'em so *they* can't lose. But don't print my name—I don't want to have my own contract cancelled." (Apparently his deal is not *too* full of holes, so far.)

Cherry County in northwestern Nebraska is larger than the combined areas of Rhode Island and Connecticut — and produces more cattle than any other single county in the United States.

"It's not all clear sailing," agreed one of his neighbors. "I don't know where the hogs came from, what diseases they've been exposed to, whether they'll gain well or not. And if you don't do exactly what they tell you to do, you're out."

Feed dealers, who are promoting these deals, agree that a shortage of good feeder pigs is holding them back. Says one, who has about 1,000 head out on contract now: "If I could get pigs at a fair price, I could place 5,000 more within a month." One northern Georgia feed man may have the answer: He's financing a 96-sow "pig hatchery" — is counting on it to produce 1,600

feeder pigs a year. Sounds like the broiler business, doesn't it?

Tommy Primrose is one of 20 farmers in Jasper County, Tex., who have built a 22′ x 30′ pig "parlor" from plans furnished by the Ralston Purina Co. These "parlors" are actually a low-cost pole-type shelter built over a concrete slab. They're designed to handle 40 pigs to market weight —cost only $400, including waterers and feeders.

Primrose has put two lots of hogs through his parlor. On the first run of 50 pigs, he signed a $1,500 note to the feed dealer who furnished both the pigs and feed. Primrose settled when he sold the pigs. Actually, he just broke even.

On the second batch, which he raised himself, the dealer financed only the feed.

Says broiler-grower Primrose: "If you can get good, healthy feeder pigs at a fair price—say 1½c to 2c over slaughter market — there's more money in pigs than in broilers. But you can't pay 20 cents a pound for feeders and sell for 15 cents—as some of us did—and expect to make money.

"*There's a lot less work* with pigs than with broilers. With the feeders, everything is automatic except washing the floors. That takes 10 minutes a day."

"Best paying job on the farm," comments Rockford Greene, Hancock County, Tenn., after finishing out 50 feeder pigs. "I netted $344.80 after all costs. I had the pigs for 10 weeks and they never took more than an hour a day. That's nearly $5 for every hour of work!"

There you have two of the sells that feed dealers are using—some form of financing and the bait of a money-maker that does not take much work.

But probably the best salesmen of all are the dozens of farm "demonstrations" showing that *good management and good feed can produce amazingly efficient gains.*

As with broilers, any of the dealer-financing plans actually force the farmer to follow the best practices. But even without them, the alert dealer is always liberal with helpful ideas to make the farmer's pig grow faster. His object, of course, is to build up business.

When W. E. Wood went into the feed business in Lufkin, Tex. a few years ago he started pig-feeding tests in his store. "We could always get gain for 9c to 10c a pound," relates Wood. "But I couldn't do it on my own farm using pigs from the same litters and using the same feed.

"Jim Windham, Purina's area salesman, and I talked a lot about this and decided that we needed to get those pigs up off the ground and confine them in an

easy-to-clean house. We wanted a practical unit that would help pigs gain as fast on a farm as they did in our store.

"That's how the pig parlor idea came about. I built one on my farm and since February 1956 we've run five bunches of pigs through. Cost of gain has varied from 9c to 12c a pound, figuring the same feed price as we charge a farmer. Our 12 customers with parlors have done just as well."

Total agricultural output in the United States set a record in 1956, despite poor growing conditions and government programs to curtail production.

Most farmers who've followed the dealer's program all the way have gotten good gains. For instance, Willis Hardy of Pike County, Ga. averaged one pound of pork for each 3.01 pounds of feed at a cost of 9.35c a pound. He got a labor return of $11.90 per pig on his lot of 50 head.

In Buchanan County, Mo., Bob Madget recently sold his 49 head of parlor-fed hogs. He got a pound of pork for each 3.18 pounds of feed at a cost of 10.2c a pound.

And in Maricopa County, Ariz., Glenn Witcanack put 50 Hampshires in his Purina-styled parlor. His gain averaged two pounds a day with a feed conversion of 3.3.

Some feed dealers are so confident that their feed will produce good gains that they make a deal with the farmer accordingly.

One is Zach Taylor, manager of Farmer's Feed Mill, Newbern, Tenn. He has a deal right now with the owners of some 700 feeder pigs—"and we'll have 5,000 as soon as we get a good source of pigs." They pay Taylor so much per pound of gain for the feed *when they sell their hogs.*

Most of this new crop of hog feeders in the South are either building the new parlors (Purina estimates that at least 1,700 have used their plan) or are converting broiler houses.

In the Corn Belt, there's a wholesale conversion of horse barns, sheds, even garages. In most cases it consists mainly of pouring a concrete floor, putting in waterers and self feeders.

Boyd Kenner, who farms 160 acres in Andrew County, Mo., sold off 500 hens from his 1,100 flock and partitioned off part of the laying house. He has 56 pigs in now—may convert the rest of the house and add enough sows to keep it filled.

We're willing to try most anything," admits Mrs. Kenner. "Certainly can't make out raising 25-cent eggs."

It's too soon yet to tell what effect this confinement-unit system will have on the hog business.

No question but that the idea's booming.

"We'll have 5,000 pig parlors in operation in the South by the end of 1957," predicts Walter Montgomery, southern division livestock sales manager for Purina. That could be just a starter.

It will mean a lot of pork on the market. If the trend continues, well-informed livestock people believe the South will be self-supporting on pork by 1962, perhaps sooner. It now imports about 40% of its consumption from the Corn Belt.

The pig-parlor idea is just starting to roll on the West Coast, which now imports 85% of its pork. About 70 Purina units have been built by Arizona and Southern California farmers in the last 60 to 90 days.

Some farmers are already planning batteries of units.

Hog men everywhere will watch the developments with keenest interest. Particularly watchful will be the Corn Belt hog raiser, who until now has had a countrywide market for his product. He faces new competition and he's going to have to step lively to meet it.

New Repellent Fights Summer Bugs

The insects which usually chew on outdoor workers and vacationists will have to confine their dining to those who do not know about a new insect repellent developed by the U. S. Department of Agriculture.

The discovery and perfection of diethyl toluamide by the USDA has been announced. This new solution is the nearest to an all-purpose repellent yet developed.

It has a lotion-like, non-greasy consistency, a delicate pleasantly-fresh fragrance, and a resistance to rubbing or wearing off that makes one application last several hours.

The tests of the USDA research chemists showed that diethyl toluamide wards off mosquitoes better than any other chemical or combination of chemicals. It rates best against several kinds of biting flies, and is highly effective against fleas, ticks and chiggers. Against chiggers especially, clothing may be treated with emulsions of this repellent or by dry-cleaning preparations containing it.

Children playing outdoors are the chief sufferers of insect bites and, because of this, mothers will be interested in the new chemical, which is safe to apply to the skin and will not stain fabric.

Preparations containing diethyl toluamide will sell under brand names, but their labels will list the new chemical.

—University of Arizona

More Money with Less Layers

Are we crowding birds too much? With four square feet, this man's layers produce 5% to 10% more eggs . . .

Condensed from New Jersey Farm & Garden

Jerry Taub, Spruce Poultry Farm

A FEW weeks ago, I was visiting a friend when he asked me about the 1956 New Jersey Flock Mating Test.

He said, "I was checking over the final results of the Flock Mating Test and I took an average of the top 10 pens. The average income per bird was $5.65. Would you say that if I bought 1,600 chicks from one of those top 10 breeders I could gross better than $8,000 over feed costs?"

This was a good question and it made me stop and think for a minute. I finally replied that he might be able to do it if he had 100 pens of 16 birds. We both smiled at the thought.

Later, I began to think about his question again. Why couldn't we even approach these figures on commercial farms? These test birds earned $5.65 per bird over rearing and feed costs for 11½ month's production based on 240 eggs per bird and receipts of 46.8 cents a dozen average during test period. Since feed is supposed to represent 60% of the cost of producing an egg, let's say that all other costs are represented by 40% of $5.65, or $2.26. This leaves a net labor income of $3.39 per bird. Even these figures are out of reach of commercial poultry farms so I started to make some comparisons.

For those unfamiliar with the method of running the Flock Mating Test, I'll review it briefly. Thirty chicks are selected at random from a complete hatch at the hatchery. These chicks are banded by someone from Rutgers and then grown by the farm making the entry. When the chicks are mature, Rutgers selects 16 laying pullets from those remaining. These pullets are taken to

Reprinted by permission from New Jersey Farm and Garden, Sea Isle City, New Jersey

Vineland and put into small colony houses where a record is kept of the feed they consume and of the income from the eggs they produce.

The birds are weighed when they arrive at Vineland and a debit is made to the pen on the basis of six pounds of feed for each pound of pullet entered. (Six pounds of feed is the average amount used to produce a pound of meat on a growing pullet.) At the end of the test the birds are credited with their meat value by multiplying the pounds of hens remaining by the current price per pound.

All prices for eggs are also current Urner-Barry prices. The net income is arrived at by subtracting the value of the feed used and the loss or gain in meat value from the value of the eggs produced.

Low Mortality: Lots of Eggs

Of course, the most important contributing factors to last year's results were high average egg production and low mortality. I don't know the details for the other pens, but our pen, for example, finished in sixth place. It has a hen-housed average of 240 eggs per bird and hen-housed mortality of 6%. They earned $5.53 per bird over feed costs. These two items were the main reason the birds earned so much, aside from a favorable egg price. But how were they obtained?

In searching for comparison between test and commercial conditions, we can start by eliminating several things—first of all, housing. The birds are housed in small colony houses which are just barely adequate. They are not insulated or heated and in some cases you can see daylight between the boards. What about feed? Only an ordinary local mix breeder mash and grain are used. No medications or supplements of any kind are fed. The birds are given all the mash they will eat and about 12 to 14 pounds of grain per 100 per day. Feeding and watering space are very adequate. There is a three-foot mash hopper and a large open water pan in each pen. Grain is fed on the floor.

In my opinion there are three very significant items which contribute a lot to the high income obtained.

First is the amount of floor space per bird. The houses are 8x10 feet—or 80 square feet. This allows five square feet per bird.

Second, the pen holds only 16 birds. I don't think we should cut our pens down to house only 16 birds and give them five square feet apiece. But I do think we may be sacrificing too much by the trend to larger pens and by the trend to anywhere from 1 to 2½ square feet per bird. I know that production in a pen

of 1,000 birds will usually be from 5 to 10% lower than in a pen of 150 layers.

I know that birds that are crowded down to two square feet will not lay as well or live as well as birds that are housed at three or four square feet per bird. We have proven this to ourselves by selecting 20 birds at random out of a pen of 200 layers. We put these 20 birds in a small pen with four square feet of space per bird and they will always lay from 5 to 10% better than the pen they were taken from, with less mortality.

I am often reminded of the old saying that if birds are crowded they will die off until those remaining have the proper floor space. Usually those remaining will not do as well as if they were given the proper floor space to begin with. Perhaps we are sacrificing too much for good labor efficiency.

The third important point is selection of the pullets. As mentioned earlier, there are 30 pullet chicks banded. At Spruce Farms, we raise between 24 and 27 of these chicks. Some die, some lose their bands and some are not recognized since they are raised with the rest of the flock. We select the best 16 pullets by trapping them for a week or two and choosing those that show the best rate of lay.

Best Birds Show Early

I don't mean that a poultryman should keep only 16 pullets out of every 30 he starts, but I think a much closer selection should be made after birds have been laying a month or two. Some of the poorer birds should be disposed of. I have seen records which show that birds which lay the best during the first month usually will make the most money for the year.

To summarize, I think the average poultryman would come closer to approaching the $3.39 per bird figure (which at present prices is certainly unattainable), (1) if he houses only three-fourths as many birds per pen as he now does, giving his layers at least four square feet per bird; (2) if he broke down large pens of 500 to 1,000 birds into units of 200 layers; (3) if he selected his pullets very closely at the end of one month's production, possibly trapnesting them for two or three weeks and disposing of the poorer birds.

I know people who have followed some of these suggestions. They are operating with half to three-quarters of the layers they used to have in the same space. They finish the year with more money and a lot less work. Perhaps if we all followed this example we would be better off and some of the surpluses that plague us would disappear.

Government Quandary: Saving the Soil

Federal officials, deep in farm plenty, still push conservation . . .

Condensed from Wall Street Journal

Lee M. Cohn

DESPITE today's farm plenty, Federal officials are conjuring spectres of eventual hunger, thirst and barren land. These visions are haunting them into pushing soil and water conservation harder than ever.

"The quickest way to get a shortage of food and raw materials would be to let the land go down," says a high-ranking conservation official, explaining the growing emphasis. "I'd hate to see us solve our production and surplus problems by losing the ability to provide what we need for a growing population."

In the months ahead, Federal farm officials will plunge into a $150 million, long-range program to rescue the drought-seared Great Plains, from Montana to Texas, from the effects of water losses and wind damage. After exhaustive soil surveys, farmers will contract to do a soil saving job over a period of up to 10 years. Uncle Sam will pay up to 80% of the cost. The contracts will call for such drought defenses as special terracing to curb water losses and strip-cropping—alternating strips of close-growing crops like grain sorghums with row crops—to outwit the wind.

Working With Water

To prevent erosion and increase water supplies, the Government is plowing ahead with a 1954-born program to develop small watersheds with flood control dams and with conservation work on nearby land, including planting of trees, filling in gullies, installing drainage systems and the like. Federal financing pays for flood-control work; farmers share costs of other work with the Government.

To help rejuvenate marginal crop land, Federal officials are gunning for a sharp gain this year in acreage deposited in the soil bank's long-term conservation reserve. Under this scheme, Uncle Sam pays farmers annual "rent" for land switched from

Reprinted by permission from Wall Street Journal, 44 Broad Street, New York City 4

crops to grass or trees for 3 to 10 years. The Government also chips in up to 80% of the cost of establishing the protective cover and doing other conservation work. While this program also aims at pulling surplus crop land out of production, officials claim it has a real soil saving potential, too.

Soil Bank Interest

About 1.5 million acres went into the conservation reserve in last year's late spring program. Officials figure the idled land may jump to 8 million or 10 million acres this year. They aim eventually to sign up 20 million to 25 million acres. Most of it is poor land they hope will be kept free of crops at least until food and fibre surpluses disappear. By then, officials reason, the idle land may be needed; in some cases, the rest from cultivation may improve the soil's ability to hold water.

Harnessed up with these newer, more specialized conservation efforts, a broad 21-year-old soil saving program of the Agricultural Conservation Program Service is still moving ahead. Under this set-up, no less than 1,142,000 farms and ranches carried out conservation practices with Federal financial encouragement in 1955, the latest reported year. That was 46,000 more than the participants of the year before. These farms, located in every U. S. agricultural county, make up one-third of the nation's farm land.

The steps taken in 1955, with the cost usually split 50-50 between the farmer and the Government, included planting of 12.6 million acres of protective cover, such as grass; 1.5 million square feet of sod waterways in fields to dispose of water without erosion, and 6 million acres of stubble mulching — leaving crop residues on soil to control wind and water damage.

All told, the Agriculture Department's contributions to direct conservation work promise to climb to $635 million next fiscal year. That would be nearly 10% above expected spending this year and more than double last year's actual outlays.

Two Questions

Critics raise two questions about soil conservation programs. They ask whether efforts to build up farm fertility don't actually risk production of still greater surpluses. And they question whether the Government doesn't sometimes pay the farmer to do work he should and perhaps would do on his own under sound farming practices—in effect making these programs a form of a handout.

To the fears of growing gluts, farm policy makers reply by citing forecasts that a population of 220

million persons will need at least 40% more food and fibre in 1975 than Americans consume today.

"I don't think conservation is adding to our surplus or excess production problems," maintains Ervin L. Peterson, the assistant agriculture secretary who rules the conservation domain. "Even if we assumed it were, it still would be desirable public policy to protect the physical capital of our plant because we will need it in the future."

At 90 years of age, Joseph Steacy of Brockville, Ontario (Canada) runs his own farm, driving the tractor and pitching hay as part of his regular farm chores. Do you know of an older, active farmer?

Nevertheless, Government policy does recognize that some types of land treatment can boost output sharply and quickly. Officials therefore try to steer clear of outlays to help farmers bring new land into production of surpluses through drainage or irrigation projects.

Worries over making handouts of soil conservation payments are shared in varying degree by many Federal officials. Last year the Administration opposed, though Congress passed, a law making the Government pay full costs of flood prevention phases of watershed developments.

Fertilizing and Financing

After Agriculture Secretary Benson took office in 1953, he set out to eliminate Federal payments for routine farming costs. An aide explains the policy thus: "Fertilizing cotton is part of the cost of production, so normally there's no sharing. But if a farmer shifts from soil-depleting row crops to grass, we may help him fertilize the acreage to get the grass started."

All three of the major new conservation programs — the Great Plains, small watershed and conservation reserve projects — hinge on a shift in emphasis from scatter-shot soil saving to long-range development of land and water.

This broad approach is vital, officials say, for a problem-ridden region like Great Plains, embracing the 10 states of Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas and Wyoming.

"It's an area that swings from wet to dry with relentless monotony," sighs Assistant Administrator Jefferson C. Dykes of the Soil Conservation Service. Back in 1871, he relates, the Union Pacific Railroad published a booklet booming the Plains states. "That same year, the Plains turned dry,

and by '72 the area was losing population."

More recently, Mr. Dykes recalls, "there was a lot of unwise settlement and plowing during World War II. It happened to be a wet year in 1941, and school teachers from Kansas City and bank presidents from Omaha bought land. There was talk that food would win the war, so a lot of public spirited citizens really did a job."

The White House building and grounds cover an area of sixteen acres in Washington.

Set to Blow

Shortsighted, sloppy farming has helped make the Great Plains a monumental agricultural problem. Drought has hit hard—perhaps the hardest in history. Some 3.2 million acres of dry land, according to the Agricultural Department, were damaged by wind erosion in November, December and January, the first three months of the current "blow" season. As of February 1, another 29 million acres were reported "in condition to blow."

February rains, which slowly soaked much of the Southwest, improved livestock grazing and crop prospects, particularly in eastern parts of Texas and Oklahoma. The precipitation, which left most areas still behind on "normal" rainfall, freshened wheat already up and opened the way in some sectors for planting of small grains, cotton, cover crops, and vegetables. Still, farm experts note, March winds will bring the usual "dusters." Lengthy, drizzle-type rains are needed to penetrate parched soil and to assure crops and pastures.

Administrator Donald A. Williams of the Soil Conservation Service insists the Great Plains program is not "jerry-built to wash out the next time rain comes," as has happened with past efforts.

Mr. Dykes reports: "The program emphasizes a shift in land use. It's only partly a matter of turning the Plains back to grass. Only about 25% — perhaps 10 to 14 million acres — of present crop land needs to be retired permanently to grass. That's land with shallow soil that shouldn't be plowed, or light soil that will blow without cover between crops."

The Great Plains program will push other practices such as planting rows of trees as wind breaks. It also may call for switching from one crop to another to protect the soil.

Planners have sped up preparatory work, and the Administration has requested $17.6 million for payments to farmers during the fiscal year starting next July.

when the program actually gets under way.

Some Bitter Medicine

Meanwhile, the department has been waging an educational campaign to sell the program. "It's bitter medicine for some people," Mr. Dykes observes. He says some real estate men, Chambers of Commerce and others try to discourage participation on grounds it would hurt the county's name to advertise its drought troubles. Nevertheless, he adds, "I don't think there's any question that we'll have takers."

Water, of course, is as important as soil to agriculture. In many areas, Mr. Benson declares, "water is the greatest limiting factor for both agricultural and industrial development." Experts predict current U.S. consumption of nearly 200 billion gallons of water a day will double in 25 years. They estimate it takes 3,000 gallons of water to grow a pound of cotton, 1,800 gallons for the grain to make one pound of beef.

The new watershed protection program, Assistant Secretary Peterson says, recognizes "the need to begin managing water where it falls upon the land."

A more or less typical watershed project is under way on Long Branch Creek in Noble and Payne counties, Okla. The aim is to cut estimated annual flood damage in a 28,000-acre area from some $38,000 to under $6,000. To do this, there'll be 11 dams with a total capacity of 5,000 acre-feet, cover crops and grasses planted on 11,000 acres. 280 miles of terraces and 49 acres of protected outlets to carry runoff from terraces, and like measures. Of the estimated $624,000 cost, Uncle Sam will pay $284,000 and local people the rest.

Farmers generally seem to share the Government's enthusiasm for conservation. One official comments: "You would expect the cost-price squeeze and the drought to cut down on conservation spending, but instead farmers are doing more. Even if the farmer would prefer to cut corners, he finds he just has to step up his conservation work."

Piping Water to Cattle, It's Easy

The new plastic water pipe that easily can be laid in a furrow turned by plow is proving useful in piping water to cattle in pastures. It may be installed simply by plowing a single furrow from the nearest water supply line to the pasture, laying the pipe and tipping the furrow slice back over it. The pipe will be protected, it will stay relatively cool, and it can be pulled out readily if necessary. See page 35, FARMER'S DIGEST for December for more information.

How To Judge a Good Udder

Let's take a look and a test to see if you know what makes a good udder . . .

Condensed from Western Dairy Journal

Lyn MacDonald Allen,
Tomorrow's Western Dairyman

THERE is one major feature given more weight than any other on the standard dairy score card. That's mammary development. If you had a good, healthy and vigorous cow, ideal in dairy character and conformation, with plenty of body size and capacity, you still wouldn't put her up to first place if she had poor udder development.

The same goes for an animal you were picking for your foundation herd.

What constitutes a good udder? Let's take a look!

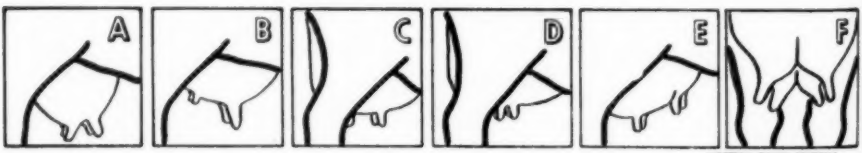
Shape

When in full milk, a good udder is large. It extends well forward and far up behind, and is firmly attached to the body. Bottom, or floor, of the udder is broad and level. The four quarters are uniformly developed, showing no marked separation.

Looking at it another way, the udder must be large enough to make and hold the milk produced. So, the larger the better, generally is the rule. Cows with small udders can't be high producers. When the forward and rear attachments are strong, a well-shaped udder will have the greatest capacity, and isn't apt to break down and become pendulous.

A correctly shaped udder not only has greater capacity than many of the poorly shaped types,

TROUBLE SHOOTING



What is wrong with each of these udders?

If you turn to page 28 you can check your answers.

Presented by permission from Western Dairy Journal, 4511 Produce Plaza, Los Angeles 58, Calif.

but it is less likely to be injured. And, too, it adds greatly to the beauty of the animal. Shape is especially important in show ring judging.

When it comes to your commercial milking string project, here is a thought to consider—the deep milking cows always have udders of large capacity and good texture.

There are enough automobiles in this country for all 167 million people to ride at the same time.

Texture

A good udder is soft, pliable and free from lumps. A hard or meaty udder is undesirable. Glandular tissue, ducts and reservoirs, which produce and store milk, give a soft texture to the udder. But connective tissue which serves as support produces a hard texture. Large udders, made up chiefly of connective tissue, feel hard to the touch, and just don't produce large amounts of milk.

A good quality udder collapses when milked out and hangs in loose folds from the rear attachment.

A poor quality udder changes little in shape or feel after milking.

Udders or parts of them that have been badly infected with mastitis develop large lumps. This is due to milk secreting tissue being replaced by hard connective tissue.

Teats

Teats on a good udder are placed squarely, uniform, of moderate size and easy to milk. Lumps or hardness are not wanted here, either.

Milk Veins and Wells

The other two parts to the mammary system, in addition to the udder and teats, are the milk veins and milk wells. Part of these are visible and part are hidden.

Because those not seen serve the same purpose, USDA specialists recommend the milk veins and wells not be over emphasized in judging.

Milk veins are the large blood vessels usually visable on the under side of the abdomen. They carry blood back to the heart after it has supplied the milk-secreting glands. Large, long, crooked and well-branched veins are considered an indication of good milk producing ability.

Milk wells are the holes in the body wall through which the veins pass to return to the heart. They correspond in number and size to the milk veins.

When it comes to picking your own project cattle or judging in competition, your most reliable sign of milk producing ability in a cow is her mammary system.

Learn to recognize the best, and to fault the poor.

Trouble Shooting—Answers

(Take test on page 26)

A. Pendulous udder. Caused by breaking away of the attachments, resulting in the udder dropping.

B. Poorly developed rear udder, with teats of uneven size

C. Good udder, showing perfect balance, with well-placed teats of moderate size.

D. Teats too close together.

E. Forequarters lacking in development, most common weakness of udders.

F. Front view of udder showing excessive cut up between halves and quarters.

How To Make High Quality Silage

High quality grass silage depends in a large degree on the procedures followed in making it, say Purdue University dairy scientists.

The dairy experts recommend these three steps:

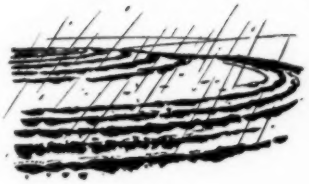
Harvest forages when the nutritive value is high. If forage will not make good hay, it will not make good silage.

Use an additive to prevent the undesirable fermentation and an offensive smelling silage. Additives are needed if forages are ensiled without wilting, when grasses are harvested in early head and when legumes are cut at any stage up through 1/10 bloom. Additives range from chemicals to blackstrap molasses. The choice should be based on cost and ease of application. Blackstrap molasses is added at the rate of 60-80 pounds per ton of green forage and dry concentrates, such as corn and cob meal, at the rate of 150-200 pounds per ton. Sodium metabisulfite, the chemical additive, is applied at the rate of about eight pounds per ton of green forage. Care should be taken to get the fine powder uniformly distributed.

Fill the silo or make the stack rapidly. Since air is the enemy of silage or fermentation, rapid filling, packing and covering can prevent heating and molding.

Farmers can control the factors which determine the quality of the resulting silages. For it is they who decide when the forage will be harvested, how rapidly it will be done and the extent to which air is excluded. —*Farm News from Purdue*

Double Duty Stubble



How one farmer keeps his soil at home by using stubble mulch . . .

Condensed from Soil Conservation

Calvin Wixom,
Soil Conservation Service

HE IS NOT known as a particularly stingy sort of person, but Delwin "Bus" Theisen is a miser with his grain stubble. First he uses it to produce a crop of wheat, and then again to keep his topsoil on top of his own land.

"I don't set myself up as an authority on stubble mulch farming," Theisen says, "and I would not try to tell my neighbors how to run their farms. But I know what I have found out on my own farm.

"There was the time when I was just starting out with this trashy fallow idea. My Dad had a field just up the slope from one of mine. Runoff water from his field flowed down onto my land. Dad was a good farmer in the days when clean, black fallow was something to be proud of. He is a believer in stubble mulch tillage now, but at that time he didn't like it and told me so. When the snow melted that spring the water and mud from Dad's field came down onto mine a little way and stopped. The stubble held my own runoff and his too."

Theisen's 680-acre wheat farm is located in the Gallatin Valley of Montana. Wind erosion is not much of a problem, but the spring runoff from melting snow sometimes causes excessive rill erosion on slopes and gullying in the waterways. Most of his cropland falls in land capability class III, due to slopes 5 to 9 per cent. He follows a simple crop-fallow rotation. The stubble is left undisturbed after harvest until the spring of the following year. His normal procedure is to use an offset disk or flexible tiller for the first operation, and then follow up with duckfoot shovels or a rod weeder. Bus has found that duckfoot shovels do a good job of killing weeds when his soil is too damp for the use of the rod weeder. He now plans to experiment with chisel points for the first operation in an effort to hold more of the stubble in, and on,

Reprinted from Soil Conservation, Washington, D. C.

the surface soil.

Seeding the new crop through stubble mulch became somewhat of a problem until Theisen purchased one of the new furrow opener type drills. This drill has shovels to open furrows for the seed. The seeds are dropped in ribbon-like rows 4 inches wide. The rows are 14 inches apart from center to center. Bus says he worried some at first about having these drill furrows on his sloping fields. His slopes are of such an irregular pattern that drilling on a strict contour is not possible. He has found, however, that each furrow carries its own share of runoff, and that the combination of individual furrows and the stubble incorporated into the soil does an excellent job of retarding erosion and leading the water into the soil.

"I used to think that deep tillage was necessary, too," he says, "I would put those chisel points down as deep as 12 inches in the belief that I was creating more moisture storage capacity. Now I am convinced that such deep tillage is a waste of power and may even cause a loss of stored moisture. I think the secret is at or near, the surface of the ground. The problem is to get the water through the surface without soil sealing and runoff. Now I only run my equipment deep enough to keep it operating smoothly and to kill weeds, although I do sometimes put the chisels down a little deeper to break the hard sole caused by the rod weeder."

Theisen was already experimenting with tillage for the control of erosion at the time he applied to the Gallatin Valley Soil Conservation District for technical assistance, and a conservation plan, in 1951.

"I don't make any claim of increased yield," he says. "In fact, stubble mulch fallow might cost a few bushels. But I am keeping my soil at home, and total yields over the years ahead should more than make up the difference."

Pigs Are Drunk

French railroad officials were astonished recently when they opened a railroad truck.

The truck was supposed to contain a shipment of live pigs. However, they found all the pigs stretched out unconscious.

Mystified officials continued their investigation until they found a broken wine barrel. They concluded that the truck had hit a bump en route to the station, breaking the pig pen and the wine barrel. The pigs were just drunk. —*New York Times*

Farm Vacations, Inc.

City folks pay for privileges that are an everyday part of farm life. Farmers over the country are taking in summer guests . . .

Condensed from The Farmer

GOT a bedroom that won't be used this summer? It might be a money-maker.

A national organization—Farm Vacations and Holidays, Inc.—is helping turn extra bedrooms and a knack for making friends into added income for a few Upper Midwest farm families.

Farm Vacations got its start in New England. It deals in assets common to all farms: fresh air, sunshine, good home cooking and the opportunity for city children to become acquainted often for the first time, with farm animals.

For the city family it offers a chance to get away from hot, noisy streets, jangling telephones and busy schedules—and they are willing to pay for this chance.

There is nothing cut and dried about a holiday on the farm. Vacationing guests are treated almost like a part of the family. They must fit into the regular farm routine because these are not "dude" ranches, but regular working farms and ranches busy with the business of farming.

That is the charm, for city folks, of farm vacations. It gives them a chance to learn, firsthand, about farming—not a bad idea in this age of too much misunderstanding of the problems and privileges of modern-day agriculture.

Some guests help with chores, others with haying. City boys have learned to drive tractors; younger children feed lambs and get their first look at a calf. Some ride horses, go on hikes, dig wild flowers to transplant back home or gather vegetables for the noon meal.

"We came to South Dakota for two reasons," says L. J. Oblack of Milwaukee, Wis., a visitor last summer to the Flying U ranch

Reprinted by permission from The Farmer, St. Paul, Minnesota

in South Dakota. "Our daughter wanted to ride horses, and we wanted to see a different part of the country," continued this city-born and reared representative of a trucking firm.

Ranch Nicely Located

The Oblacks chose the 4,500-acre Flying U, which lies sprawling along the White river across from the Sioux Indian Reservation in Jackson County. Located in the South Dakota Badlands, the Flying U offers vacationers rugged scenic beauty, a private bass pond, roping matches, chuck wagon meals, round-ups and rodeos, trail riding, hunting in season and unspoiled Western ranch life and hospitality. The Black Hills are nearby.

Simcoe County (Canada) farmers in 1955 lost $5,600 in sheep to wolves but lost none last year. Instead, they collected the $25 bounty on each of eighteen wolves they killed.

Closer at hand are the picturesque ranch buildings nestled along a bend in the river, five riding horses, white-faced cattle, a few milk cows, 200 acres of alfalfa, the usual ranch chores and the six Flying U hosts—Byron and Dorothy Bradfield and their four daughters.

A native of the Badlands, Mr. Bradfield has spent most of his life at ranching there. An old hand at raising, breaking and selling horses, he also has experience as a guide and as a riding instructor in a boys' camp, all of which helps make time spent by guests more pleasant.

Byron and Dorothy, and their daughters are friendly folks. They like people, an essential to success as vacation hosts. They can make incoming guests feel at home, like old friends. First names are used at once. Mrs. Bradfield and her daughters spread good ranch meals on their big, oval family table—another essential that warms a newcomer to farm or ranch life in a hurry.

Guests, once they arrive, can do as much or little as they wish. Some take it easy, others mow hay, do chores or even stack hay. One or two have painted the multicolored Badlands. Nearly all ride. "Our guests are free to take part in any ranch activity they want to," says Mr. Bradfield.

"It's so quiet here. We're off by ourselves with no false fronts," added one guest of the Bradfields. A commercial artist from New York who has vacationed all over the world, spent two weeks on the Flying U with her two daughters. She now wants her daughters to spend an entire summer.

That hasn't been possible as yet, however, partly because the Bradfields usually have reserva-

tions booked for most of their June-to-September season, and partly because they cater primarily to family groups. Their home contains three double bedrooms for guests and it is simpler to accept only one family at a time.

Those three extra bedrooms are a regular part of the Bradfield ranch home. There have

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up faster. (Vacation rates are age $30 to $40 per adult per week and $20 to $25 per child per week.)

Nationally Organized

The Bradfields learned of Farm Vacations, Inc., two years ago. They wrote the organization, which has its headquarters in New York, describing their accommodations and enclosing their membership fee. After their ranch was checked for the standards that vacationers expect, it was listed in the Farm Vacations and Holidays book which is printed and distributed to prospective vacationers each year.

The Bradfields' first guests arrived July 1, 1955. By the close of their season last fall they had accommodated over 20 families. The guests, all city folks, were from New York, Wisconsin, Ohio,

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Cor and Henrietta Bos of Pipestone County, Minn. They signed their 320-acre "Riverside Acres" farm with Farm Vacations in 1954. That first year they had only one guest, a teen-aged boy. In 1955 they had six guests. Last summer registration jumped to 24.

Their city visitors came from Pittsburg, St. Louis, Chicago, Omaha, and Minneapolis. Guests have included three doctors and

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It all goes to show that farming is like any other business . . . .

You have to keep informed to succeed with it. That is why Farmer's Digest is so important to you . . . why you should read every issue. Only Farmer's Digest gives you so much usable information in palatable, easy-to-read form at so low a cost. In Farmer's Digest, you get the very best from more than sixty U. S. and foreign farm magazines.

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tions booked for most of their June-to-September season, and partly because they cater primarily to family groups. Their home contains three double bedrooms for guests and it is simpler to accept only one family at a time.

Those three extra bedrooms are a regular part of the Bradfield ranch home. There have been no extras added for guests. "We haven't spent a dollar for extra accommodations," says Mr. Bradfield, which is true of most other farm vacation hosts. Because there is scarcely any cash outlay other than for food, net income from paying guests piles up faster. (Vacation rates average $30 to $40 per adult per week and $20 to $25 per child per week.)

"They must have a girl's ball team in the harem."

"What makes you think so?"

"I just heard one of the girls ask the sultan if she was in tomorrow's line-up."

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The Bradfields' first guests arrived July 1, 1955. By the close of their season last fall they had accommodated over 20 families. The guests, all city folks, were from New York, Wisconsin, Ohio, New Jersey, Illinois, Idaho, Connecticut and one man from Nassau, Bahamas. He came during the calving season in May, stayed two weeks, then flew from South Dakota to London, England. Most families stay for a week. Some, finding farm vacations to their liking, have returned.

"Besides those who came, we have had three times as many inquiries as we've had room for," says Mrs. Bradfield. "It's a sideline, but it is helping put the girls through school," was Mr. Bradfield's comment.

Another family that made farm vacations a summer sideline are Cor and Henrietta Bos of Pipestone County, Minn. They signed their 320-acre "Riverside Acres" farm with Farm Vacations in 1954. That first year they had only one guest, a teen-aged boy. In 1955 they had six guests. Last summer registration jumped to 24.

Their city visitors came from Pittsburg, St. Louis, Chicago, Omaha, and Minneapolis. Guests have included three doctors and

their families, a baker, a printer and the children of a machine shop worker and an engineer.

The question most often asked by prospective guests was "Is there indoor plumbing?"

Actually the Bos' have a big, modern farm home with four guest rooms, in addition to their own three. They offer horseback riding, hiking, wading, kittens, lambs, a dog, rabbits, chickens, farm livestock, piano and accordion playing, a scenic farmyard, home-baked bread, pies and cake, and a "friendly attitude" to guests.

Hog numbers will go up beginning this fall in response to a profitable corn-hog ratio. Hog prices are expected to stay at profitable levels until in the fall.

A few guests have been taught to milk cows and one young man, after learning to operate a tractor, helped fill silo.

Like the Bradfields, the Bos' vacation season begins in May and ends in September. Letters of inquiry begin arriving in April. Also like the Bradfields, they set an ample table with vegetables from the garden, fresh-dressed chickens, beef and pork from the deep freeze. Most amazing food item to city visitors is "corn on the cob, right from the field, and with *butter!*"

Not all farm families who tried Vacations, Inc., have found it successful. One Minnesota farm family, after two years as a member of Farm Vacations, dropped it. A South Dakota family dropped out after one year. Both had inquiries from prospective paying customers, but none ever stayed with them.

Use Oil to Control Bloat

The number of cases of pasture-type bloat in dairy animals was reduced, according to an Iowa State College experiment, by feeding oil to them. The cattle received it in their drinking water, when they were on alfalfa pasture, or sprayed on green chopped alfalfa before they ate it. Cattle seemed to like the oil, for they drank more water when it contained oil and they also averaged more daily gains in weight on pasture and in the feed-lot when oil was used. Its practicability depends upon the severity of bloat, cost of the oil, and whether the animal also gets some energy feed value from the oil. Soybean or a lard derivative oil was used. About a quarter-pound per head per day of either of these oils reduced bloat, the researchers report. —*Better Farming Methods*

The New Plastic Silo

Results of tests at Purdue University with silage stacks covered with polyethylene plastic and sealed with dirt.

Condensed from Purdue Mimeo DH-63

D. L. Hill, C. H. Noller, B. W. Crowl and *N. S. Lundquist*

STORING forage crops as silage holds great potential for increasing the value of grassland crops.

The Purdue Dairy Department has been conducting research in the making and feeding of grass silage, with special reference to quality. This past year, some very encouraging results were obtained when making grass silage in stacks covered with plastic film. These silos may be built with a minimum of labor and equipment and may be located at sites convenient for both making and feeding the silage. The capacity is also flexible for amounts ranging from a few tons to over 100 tons and can be made without affecting the quality or losses.

The Plastic Silo

The plastic silo is a rectangular shaped stack topped out so that it is rounded. Immediately after the stack is completed, a plastic tarp is placed over the stack and the ends buried in a trench to give an airtight seal. *Caution! The plastic must be protected from punctures. When punctures occur, much of the advantages of the silo is lost.*

Air is the enemy of silage fermentation and it is the function of a silo to provide airtight conditions as well as storage space. The plastic is used to form airtight and weather-tight protection for the stack. Results at Purdue and other experiment stations show that there is no surface spoilage as long as the plastic cover is not punctured or damaged.

The silages made in these stacks were very good as determined by acid development, odor, appearance and animal acceptance when good silage making procedures were followed.

A notable characteristic of uncovered silos is the very high temperature (135-140°F.) which develops. The temperatures in the plastic covered stacks did not rise above 110°F. and averaged 98°F. Under test conditions, these silos have produced ex-

Reprinted from Mimeo DH-63, published by Purdue University Agricultural Experiment Station, Lafayette, Indiana

tremely high quality silage.

Advantages which may be ascribed to the silo are that it is easily built, inexpensive and flexible. In some instances, they may be used as the only storage for silages; whereas in others they may be regarded as emergency or temporary measures to increase storage capacity for silage.

How to Build the Silo

(a) Select a cleared, well drained, level area of ground and lay out the dimensions of the stack. The width is fixed by the width of the plastic cover. The length is flexible, depending on the amount of silage to be stored, and can be adjusted. It is also possible to build the stack on a concrete platform by simply changing the manner of sealing the stack.

The following table will assist in laying out a stack using the various width plastics. Allowance is included for one foot of plastic on each side for burying in the trench.

(b) Build the stack. A flight elevator can be used. Where no power equipment is available, it is possible to build the stack by hand. Since the plastic cover can partially substitute for packing, no special equipment is needed for packing. However, the man shaping the stack should be active in tramping the forage to exclude airpockets.

We have completed and covered our silos in one day and believe this to be desirable. Until more is learned about the method, it is recommended not to take more than two days on one silo. Seal it completely and begin another silo if there is more forage to be harvested.

(c) Prepare to seal the silo by digging a trench 8 to 10 inches deep around the stack. It is possible to use a plow or other trenching equipment before the stack is built.

(d) The plastic cover is carefully placed over the stack and the ends buried in the trench. It

Width of Plastic Film ft.	Width of Stack ft.	Height of Stack ft.	Capacity per Foot of Length* tons
20	11.5	6.0	0.85
24	14.0	7.0	1.1
28	16.5	8.0	1.5
32	19.0	9.5	2.0

* Estimated capacity assumed a density of 30 lb. per cubic foot of silage stored

is recommended that the plastic cover be left in its container until ready to cover the stack. This precaution will help prevent damage to the plastic.

In the event the stack was made on concrete, the seal is effected by weighting the edges of the plastic tarp with fence posts or timbers and then weighting with soil between the posts and the stack. The stack will settle for a few days after it is made. The slack which develops in the plastic cover should be removed by again weighting the edges with soil. A loose cover is susceptible to wind damage.

Average meat consumption per person reached a new high of 164.7 pounds in 1956.

(e) Protect the silo from damage. Livestock must be fenced out. Falling limbs will damage the plastic. Wild animals as well as dogs and fowl can puncture the plastic. The stack will not withstand the playful romping of children. Punctures and tears should be repaired immediately using a suitable pressure adhesive tape which can be obtained in most drug or department stores. In the event of severe damage to the plastic, a new cover should be used to cover the stack. The success of this silo depends on the airtight seal. When punctures occur and are not repaired, much of the advantage of using the plastic cover is lost.

A great deal remains to be learned about plastic and how to make the best use of it. To date, we have used only polyethylene plastic, which was 4 mils (.004 inch) in thickness. The susceptibility of this weight film to puncture indicates that the tougher 6 mil (.006 inch) film should be used to increase the resistance against puncture. When polyethylene films are used, the black weather-resistant type is required. The clear plastic will not last when exposed to the sun. On one of our silos, it did not last 3 months.

Quality Grass Silage

In producing quality silages, the nutrient content of the forage and the type of fermentation which takes place in the silo must be taken into account. These factors in turn influence the rate at which the silage is consumed by the animal.

The efficient use of grassland crops as silage is dependent upon employing procedures which make for high quality silages. The farm operator can control the factors which determine the quality of the resulting silages. Weather and equipment permitting, he makes the decision as to when the forage will be harvested. Furthermore, he is responsible for following silage-making methods which

result in favorable fermentation. It then may be said that silage is what he makes it.

Although there have been many opinions expressed concerning the making of grass silage, on the basis of the available information, we recommend the following:

1. *Harvest forages when the nutritive value is high.* If forage will not make good hay, it will not make good silage. Be ready to make silage at the right time, since a few days can markedly change the nutritive value.

2. *Use an additive.* Silage additives are used to prevent undesirable fermentation and an offensive smelling silage. They are needed if forages are ensiled without silting, when grasses are harvested when in boot or early head, and when legumes are cut at any stage up through 1/10 bloom.

3. *Fill rapidly.* Since air is the enemy of silage fermentation, rapid filling and packing can prevent heating and molding. Finely chopped forage packs more readily than coarsely chopped or long grass.

Follow these three rather simple recommendations and you are virtually assured of high quality silage year after year.

Silage Additives

Silage additives may be classified according to the manner in which they exert their influence. Blackstrap molasses and dry concentrates act by providing carbohydrate as an energy source for lactic acid-forming bacteria; thus they promote a rapid and complete fermentation. Blackstrap molasses is added at the rate of 60 to 90 pounds per ton of green forage, and dry concentrates at the rate of 150 to 200 pounds per ton. Corn and cob meal, ground corn, oats or barley, dried beet pulp and dried citrus pulp have been used satisfactorily. The chemical additive, sodium metabisulfite, acts by inhibiting bacterial activity and subsequently allowing the lactic acid bacteria to become active. It is applied at the rate of about 8 pounds per ton of green forage. Care should be taken to get the fine powder uniformly distributed. The choice of additive should be based on cost and ease of application.

Plastic film has been used to cover stacks of corn silage. The results are inconclusive at the present time. Almost without exception, a yeasty silage developed on the surface (10 to 14 inches) of stack. Yeasty silage is not stable and will spoil. The silage beyond the 10 to 14 inches of yeasty silage was entirely satisfactory for feeding. It was also noted, when these silos were opened for feeding, that molds developed on the surface rather quickly as compared to grass silage. Ways and means of avoiding this shortcoming are being considered.

Artificial Breeding -- Is It Practical for Beef Cattle?

A major block limiting A. I. for beef is the policies of the breed associations.

Condensed from Breeder's Gazette

Dr. H. A. Herman,
National Association Artificial Breeders

THE BIG opportunity — and the major challenge — for artificial insemination today is to make Better Beef as well as More Milk. But before you can judge whether it might help you get faster-gaining calves at lower cost you'll want to look at the whole picture, as it stands today:

The present use of artificial insemination for beef cattle, as compared to milk cows, is quite limited. More than 5½ million milk cows, or one in every 5, were artificially bred last year. But the application to beef cattle is limited to herds of four kinds of farmers:

1. *Purebred breeders* using artificial insemination with a few of their very best sires—to obtain 3 to 10 times the number of progeny natural service provides.

2. *Beef raisers* tired of a 60 to 80% calf crop due to trichomoniasis and vibriosis spread by natural service. They obtain clean bulls and use artificial insemination to reduce spread of these infections.

3. *4-H Club and FFA* members and small breeders who cannot profitably maintain their own beef sire.

4. *Dairymen* who are converting from milk cows to beef cattle, or who breed their poorer cows and untried two-year-olds to beef bulls with the idea of "beefing" the offspring, and to get a smaller, easier to deliver calf.

Beef and Dairy Have Different Rules

One reason more purebred beef calves are not produced by artificial insemination is the ruling adopted by each U.S. beef breed association saying that the same person must own *both* the sire and the dam. Several beef breed records permit three owners of the bull used for artificial service, and one allows four. So three or four breeders can utilize a sire simultaneously if transportation makes this practical. And

Reprinted by permission from Breeder's Gazette, Stockyards, Louisville 6, Kentucky

by using frozen semen this feat can be accomplished easily even though the herds are a thousand miles apart.

The dairy breeds, including Milking Shorthorns, register the offspring resulting from artificial insemination — simply providing rules to ensure the identity of the sire, identification of the cow at time of insemination, and careful reporting. That way, a recognized artificial breeding organization, of which there are 90 in the U.S.A., can mate cows in thousands of herds to one registered bull—and register the progeny wherever the cows are also purebred.

With frozen semen, the dairy breeds allow the amount on hand at the time of a sire's death to be saved, providing the number of ampules is declared to the breed registry office. The beef breeds require that the "semen in storage dies when the bull dies." This represents a difference in philosophy—on one hand the desire to utilize truly great sires as fully as possible; on the other, preservation of the ordinary young bull market.

More Get from Great Sires

In natural breeding, a bull will sire 30 to perhaps 90 or 100 offspring a year. When artificial insemination is used, the number of calves sired runs from several hundred to several thousand. In dairy cattle the average A.I. sire is credited with 2,210 inseminations a year. The better, proved sires contribute 4,000 to 8,000 inseminations. A truly breed-improving sire can thus stamp thousands of progeny a year with its influence to better the breed.

So the $64,000 question becomes "Shall we use the best beef sires intensively, and extensively —or shall we preserve a broader bull market?" Not every bull calf dropped is a herd improver. Dairymen have demonstrated rather remarkably the results of focusing gene power in fewer, more productive sires.

The average 1,000-pound steer provides only 140 pounds of steak when butchered. Thirty-five pounds are Porterhouse, T-bone and clubsteaks; 55 pounds sirloin and 50 pounds round.

Rate-of-gain trials in Canada show a wide variation in the progeny of different beef sires—just as do similar studies in this country. If we want better *feed utilization* and greater *rate of gain,* our future beef sires must be selected on that basis. And once an outstanding sire is proved, he should be *fully utilized* if his influence is to make any lasting impression on the breed.

Artificial insemination, using bulls free from trichomoniasis and vibrio fetus, can do much to re-

duce the spread of venereal disease and thereby insure a good calf crop. Only Bang's exceeds trichomoniasis as a cause of abortion, Virgin bulls used artificially only are already solving this problem for many purebred beef producers.

How to Hex Dwarfs

Apparently every beef breed has some sires carrying the recessive genes which produce dwarfism. One of every four calves will be a "dwarf" if such a bull is mated to a cow carrying the same factors. Since the parents are of desirable size and conformation, and the trait does not appear in any case unless carried by *both* parents, the defect is masked until the truth is exposed by some unlucky calf. This is a real problem in some herds, and poses about the same difficulty as trying to locate and eliminate the last carriers for horns when breeding for polls.

Instead of having to wait for a chance mating of a carrier bull and carrier cow to show up, if the cows which have dropped a dwarf calf were assembled into a testing herd it could soon be demonstrated whether or not any particular sire is a carrier of dwarfism. 15 to 20 matings would probably be needed to prove a sire negative for this factor, but the first dwarf calf would suggest a carrier. Artificial insemination would make a proving station possible.

Many artificial insemination organizations have beef bulls of the major breeds. The demand for beef semen comes from the small herd owner even though he can't register the offspring in the few cases where purebred cows are used; from the dairyman who is an "in-and-outer" switching from dairy to beef without purchasing females; and from dairymen who have their first-calf heifers inseminated to beef bulls for a smaller calf and less trouble at calving time.

Today, only 8% of the 5½ million cows inseminated annually in this country are serviced with beef semen. Actually, many bull studs barely break even on their beef bulls. However, they provide and improve this service when patrons demand it.

In Canada, roughly one-third of all inseminations use beef semen. All the Canadian beef registry associations except the Herefords register calves produced by artificial insemination. Roy Snyder, Manager of the Waterloo, Ont., Cattle Breeding Association says: "We have replaced scrub bulls in hundreds of herds. The calves these people are getting are our main selling point—plus the low-cost service. Most of our beef breedings are for farmers with small herds who can not possibly afford to own their own

bulls when they can get their cows artificially bred for $5.00."

Working with Cornell University, about a dozen prominent beef herds in this country are using artificial insemination. The herdsman does the inseminating.

Higher per acre yields of cotton are offsetting acreage declines. Despite a 39 per cent cut in U. S. acreage since 1951, total production has not declined materially.

Although some have only limited experience, they are getting a settling rate of 60% on the first service. Most of the herdsmen are pleased with their results. Getting the cows rounded up for insemination, and having to watch for heat periods, are the major complaints.

The years ahead will see growing use of artificial insemination in beef herds. So far as registered cattle are concerned, it may be limited to privately-owned herds. There is, however, a growing demand among grade beef raisers for A.I. service, and bull studs are continually improving the quality of beef sires kept. As patrons demand sires that produce more efficient beef calves, you will find more breeding cooperatives stressing their beef-sire service.

More and more sires will be selected on "progeny test"; as this program develops. A half-dozen experiment stations are doing progeny testing now. With progressive breeders cooperating we can expect a steady increase in record-of-performance promotion of beef cattle, as well as hogs and dairy cattle.

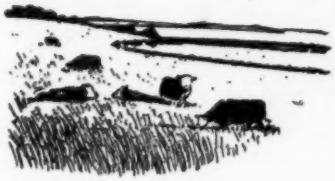
Stable Fly Control on Cattle

A chemical insecticide mixture called "F-21" was the best weapon against bothersome stable flies on dairy cattle in 1956 University of Minnesota research.

Entomologist L. K. Cutkomp reports that the F-21 formulation —containing methoxychlor and Crag Fly Repellent—knocked out up to 83 per cent of the stable flies on the day of spraying.

Methoxychlor sprayed alone on cattle reduced stable flies by about one-third on the day of spraying, and animals sprayed with malathion, another insecticide, actually had more stable flies than untreated animals. Malathion did have some effect on stable flies when mixed with Crag Fly Repellent and was effective against horse flies and house flies when used alone. The chemical was applied with "pump-up" type hand sprayers. —*University of Minnesota*

Pregnancy Testing Pays



Don't feed unbred cows. Experiment station tests show pregnancy examinations boost profits up to eight dollars a cow . . .

Condensed from
Farm and Home Research

PREGNANCY testing can increase the cattleman's calf crop by 10 per cent and his gross income by $7.88 per cow, if results are comparable to those obtained by the Colorado A & M College Experiment Station.

Dr. Howard Stonaker, experiment station animal husbandman, has been in charge of work with the test herd at the college's Fort Lewis branch station.

Pregnancy-tested cows produced 10 more saleable calves per 100 cows wintered than did those not tested, Dr. Stonaker said. Normal calf crop for this herd was 77 per cent: pregnancy testing boosted this figure to 87 per cent and raised gross income by $7.88 for each cow wintered.

"We know that every cattleman realizes the extra expense involved in carrying a barren or open cow through the winter, especially during these drouth years," Dr. Stonaker said. "The main purpose of pregnancy testing is to eliminate the "free loading" cows and make the herd more efficient and profitable."

Dr. Lloyd C. Faulkner, professor of surgery and clinics at the college bull farm, estimates the cost of testing a herd at from 50 cents to $1 per head, depending on number tested. Some veterinarians, he said, charge a flat rate of $100 a day, testing from 150 to 200 head.

Highway engineers have discovered that they can mix salt with earth to give country dirt roads a durable surface.

Best time to test for pregnancy is about two months after the bulls have been taken out or at weaning time. During the test, the veterinarian may also detect disease or deficiencies that can eliminate the cows from the brood herd.

Pregnancy testing is done by inserting the hand into the rectum and gently palpating or handling the uterus and ovaries through the wall of the rectum.

Reprinted from Farm and Home Research, Colorado Agricultural Experiment Station, Fort Collins

The hand never comes in direct contact with the productive organ. The condition of the ovaries, the uterus and even the presence of the small calf determine pregnancy.

Dr. Stonaker emphasized that the method is good, but not foolproof. Specially trained personnel should always perform the service; otherwise good cows might be culled.

To show advantages of pregnancy testing to eliminate undesirable cows from the herd, Dr. Stonaker points to these statistics:

In the period 1952-54, a total of 311 Fort Lewis cows were turned in with the bulls. Of these, 20 were sold for reasons other than pregnancy and 41 were diagnosed as "open." Total number of cows wintered was 250 and total number of calves weaned was 216.

Testing for pregnancy offers an additional advantage to the cattleman who owns high priced registered stock. Early detection of open cows offers an opportunity for special care or hormone treatments that may increase chances of conception.

Further evidence of the value of pregnancy testing of registered cows is illustrated on the Haystack Angus ranch near Longmount. This ranch guarantees that every cow sold will be delivered with normal calf at side.

Man on the phone, "I can't come to work today. My wife just broke a leg."

Boss on other end of line, "What's your wife's breaking a leg got to do with your not coming to work?"

Man on phone, "It's got a lot to do with it. It was my leg she broke."

"We can't take chances on pregnancy," says ranch manager Austin Moody. "We have to know a cow is pregnant before we sell her with that guarantee before she calves. Pregnancy testing gives us this answer and it gives our buyers the kind of assurance they like."

Opportunities in Agriculture

There are each year nearly 15,000 new jobs in agriculture other than farming awaiting college graduates trained in agriculture. Only 13 per cent of the U. S. population is actually producing farm products, but about 40 per cent of the nation's working people are employed at agricultural related jobs.

Cutting Alfalfa Early

An Experiment Station report to help you get better quality hay and silage . . .

Condensed from Wisconsin Bulletin 521

EARLIER and more frequent cutting of alfalfa is now possible in Wisconsin and other states with Vernal and Ranger varieties and with proper cutting, fertilization and insecticide spraying.

Ranger certified seed is abundant, and certified seed of the new Vernal variety is available. Both varieties are hardy and wilt-resistant. They can stand earlier and more frequent cutting—three cuttings a season—to obtain better quality hay and silage. They allow greater freedom of management than has been possible with the wilt-susceptible and less hardy varieties.

Formerly Two Cuttings Were Best

When only such hardy but wilt-susceptible varieties as Common, Grimm, Cossack and Ladak were available, alfalfa could be cut for hay only twice a season and still maintain vigorous, productive, long-lasting stands. The most favorable schedule was a first cutting in late June and a second in mid-to-late August. This schedule helped maintain strong stands needed to avoid winter injury.

Winter injury and bacterial wilt disease often go hand in hand. The wilt bacteria can enter the plant through the cracks in root and crown caused by win-

Date Cut	Stage of Growth	Per Cent Protein	Per Cent Ash	Per Cent Fat	Per Cent Fiber	Per Cent N-free Extract
Very early June	Late bud, a few flowers	20.7	7.5	2.1	28.8	40.9
Late June	Late bloom, some seed pods	16.1	6.4	2.1	36.6	38.8

The first hay crop figures in this table are averages from Vernal and Ranger from 1952 to 1955. Samples for these figures were taken from standing forage. Differences would be even greater after field curing.

Reprinted from Bulletin 521, published by the Agricultural Experiment Station, University of Wisconsin, Madison, Wisconsin

ter injury. Infected plants then die during the dry summer or are killed during the next winter since they do not harden properly.

Once a variety gets wilt, any practices that keep the stand weak, such as cutting too young or too frequently following winter injury, hasten the killing of the plants. So it is still necessary to follow a system of two cuttings to keep good stands of Ladak, Cossack, Grimm or Common.

Also, late cutting—two cuttings—is still best with any variety, including Vernal and Ranger, for the farmer who depends on a small acreage for hay. He needs a cutting schedule that best maintains vigorous and long-lasting stands. And that schedule is harvesting hay only twice a year with the first cutting in late June and the second not later than the first week of September.

Late Cutting of Vernal & Ranger

Even with the hardy and wilt-resistant Vernal and Ranger varieties, a late first cutting—late June or full bloom stage—has some advantages. It gives plants time to heal any winter injury and produce a vigorous second growth. Also, the second hay crop usually escapes any damage from leafhoppers when the first cutting is delayed until late June.

But even with these late first cutting advantages, the hay is often poorer quality, sometimes lodged, and having less leaf, more stem, and a lower protein and higher fiber content than if cut younger.

Early Cutting Improves Quality

Cutting Vernal and Ranger early is best on farms with large acreages of alfalfa. Hay quality can be improved by cutting the first crop in some fields at one-tenth bloom or earlier. Select those fields which have fertile soils and are established with Vernal or Ranger that is not winter-injured. Then cut the second crop in August and the third in October, or all three before early September.

Cutting early produces high quality hay, with a high protein

Variety and Cutting Schedule	Tons of Dry Hay per Acre					Per Cent Increase of 3 over 2 Cuts
	1952	1953	1954	1955	4-Year Total	
Vernal - 3 cuts	4.75	4.14	4.16	4.00	17.05	3
2 cuts	4.24	4.14	4.46	3.78	16.62	
Ranger - 3 cuts	4.61	4.39	4.15	3.77	16.92	22
2 cuts	3.83	3.25	3.66	3.10	13.84	
Grimm - 3 cuts	4.33	2.54	1.53	.98	9.38	-8
2 cuts	3.73	3.19	1.86	1.39	10.17	

Hay yields with two and three cuttings for Vernal, Ranger and Grimm.

and ash content and a low fiber content. This is shown in the table, page 45, which gives chemical analyses for the first hay crop from Vernal and Ranger grown in the four year period 1952 to 1955. Samples for the table were taken from standing forage. The difference in forage quality would be even greater if samples had been taken after field curing.

3 Cuttings of Vernal & Ranger

Cutting the first hay crop of Vernal and Ranger early makes it possible to get in three cuttings a season. Cutting three times gives more and better quality hay with higher protein than does two cuttings.

Tables on the opposite page and below show yields of hay and protein per acre from Vernal, Ranger and Grimm at Madison with three cuttings per season (early June, mid-July and late-August) and with two cuttings a season (late June and late August) over a four year period. With both cutting systems, plots were sprayed to control insects and soil fertility was kept high.

Grimm yielded less hay and protein under both cutting systems than Vernal or Ranger. Even though Grimm is winterhardy, it is susceptible to bacterial wilt. The stands of Grimm in this trial began to thin markedly in the second harvest year, were very thin in the third and were virtually gone in the fourth harvest year under both cutting systems. This emphasizes that early and frequent cutting should be limited to Vernal and Ranger.

Vernal Compared with Ranger

Hay and protein yields of Vernal and Ranger were about the same under the three-cutting system. However, Vernal outyielded Ranger in the two-cutting system. This is because Ranger is quite susceptible to leaf diseases and can lose a considerable amount of leaves as it matures. Vernal is moderately resistant to leaf diseases and retains more of its leaves as it advances in maturity. Saving leaves is important since about 60 per cent of the

Variety and Cutting Schedule	Tons of Protein per Acre Based on Dry Hay					Per Cent Increase of 3 over 2 Cuts
	1952	1953	1954	1955	4-Year Total	
Vernal - 3 cuts	.98	.82	.86	.79	3.45	25
2 cuts	.76	.68	.72	.60	2.76	
Ranger - 3 cuts	.96	.85	.88	.72	3.41	52
2 cuts	.67	.52	.58	.48	2.25	
Grimm - 3 cuts	.91	.53	.33	.18	1.95	5
2 cuts	.71	.58	.32	.24	1.85	

Protein yields with two and three cuttings for Vernal, Ranger & Grimm.

total protein is obtained from the leaves.

Under the two-cutting system, Ranger produced less than Vernal because of these leaf losses, but these leaves were saved by cutting at younger stages of growth under the three-cutting system. So early cutting to save leaves and protein is even more important with Ranger than Vernal. This greater increase of total hay and protein yields with three cuttings over two cuttings with Ranger (22% and 52%) than with Vernal (3% and 25%) is shown in the tables.

Grazing Vernal and Ranger

Vernal or Ranger do well in pasture mixtures because of their winter-hardiness and resistance to wilt. Other varieties usually thin rapidly under grazing where the stands are defoliated frequently.

Vernal has held up quite well in grazing trials, much better than Ranger. A Vernal and bromegrass mixture, and a Ranger and bromegrass combination were intensively grazed or clipped for three years. At the end of this period, 41 per cent of the original Vernal stand was left while the Ranger stand was reduced to 7 per cent.

Points to Consider with 3 Cuttings

There are several points besides yields of hay and protein to consider in deciding whether to make three cuttings a season. Some of these have already been mentioned.

- Cut only the winter-hardy and wilt-resistant Vernal and Ranger varieties in this manner.
- Soil fertility will be depleted more rapidly. So fertilize adequately at seeding and top-dress at least every other year.
- Spray the second hay crop with an insecticide that is not harmful to livestock if potato leafhoppers are present and numerous enough. Spray with methoxychlor at the rate of ½ pound technical grade per acre when the alfalfa is 6 to 12 inches tall or whenever the young nymphs appear, whichever is earlier. Get advice on insect control from your County Agent.
- If the stand has been winter-injured, delay cutting until late June or full bloom stage even though two hay crops are all that can be cut for the year.

Fall Management a Critical Point

A final point to consider is fall management. Don't make the third cutting later than the first week in September (in Wisconsin) unless it is delayed until October. To get three cuttings in before early September, make each cutting not later than about one-tenth bloom.

This cutting system is necessary because September and early Oc-

tober are critical months for any alfalfa variety under any system of cutting in Wisconsin. Alfalfa needs its top growth during this period to manufacture foods that are stored in the roots and crowns. Plants use these foods to develop cold resistance and to stay alive over winter.

So don't cut or graze alfalfa between the first week in September and early October. Cutting for hay or grazing is all right after early October if cold weather or frost has stopped the tops from growing. But even October cutting has a disadvantage. It removes stubble which helps catch and hold snow that protects the plants over winter.

Cattle Prices Poised for Upward Swing after 5 Years in Cellar

After 5 long years, cattle prices finally may soon head upward.

Karl Hobson, Washington price specialist, issued this encouraging forecast for cattlemen. He said cattle prices have been very low ever since the sharp break in 1952. However, beef slaughter will begin a downward trend within a year or two, stimulating an upward trend in prices. No big price jump is likely until 1960 or 1961, however, he said.

The 7-year build-up in cattle numbers ended last year and the "cutback" part of the cycle is now well underway. If this part of the cycle runs true to form, producers will reduce herds over a period of at least four years.

Price gains during the next two years are likely to be kept small by additional sales of breeding animals and by large cattle feeding operations. By 1959, hog production will again be large enough to put some damper on cattle prices. Total cattle numbers are likely to be reduced by several million head by 1960. In addition, population in the U. S. will be up by 5 or 6 per cent.

A slump in consumer income and buying power, could, of course, hobble the upward price trend. In fact, a business recession or a spread of the drought could bat prices back down temporarily to a new low.

By 1962 or 1963, producers are likely to start holding back more calves and heifers to increase breeding herds. This will further reduce the supply and increase the price of beef.

—*State College of Washington*

How to Stop Losses from Sheep Diseases

Whether or not you succeed with sheep can depend on disease control . . . .

(Eighth and last article in a series)

Condensed from Wisconsin Bulletin 470

IN SHEEP RAISING, effective disease control can mean the difference between success and failure. Often it determines whether or not the sheepman stays in business. Failure to control disease is said to be the largest single reason why farmers give up raising sheep.

Disease prevention is the most sensible and economical approach. Complete prevention obviously is not always possible. But *holding strictly to the best disease-prevention practices is especially necessary in sheep-raising,* since sheep are naturally subject to many infections.

Disease control for sheep includes *health* and *sanitary* measures as a matter of course. These are matters of good management. The "extra" need is a *disease-control program* that will give the following three-way protection:

(1) *Protection against exposure to diseases and parasites.* Here the sheepman takes precautions to prevent disease from entering his flock.

(2) *Protecting rest of flock*—and reducing exposure—when disease has already occurred. A single sick sheep threatens the entire flock.

(3) *Keeping down, or getting rid of,* diseases that have already taken hold.

1. Protection Against Exposure to Diseases and Parasites

The spread of many sheep diseases is caused by animals moving from flock to flock without enough inspection and control. The easiest way then for the sheepman to avoid exposure is to keep a closed flock. This way, he raises his own replacements. No new animals, except an occasional breeding ram, are brought in.

When buying a breeding ram, make sure you are not introducing a diseased or "carrier" animal to your flock. Have a veterinárian make a thorough physical examination, especially of the ram's

Reprinted from Wisconsin Bulletin 470, More Profit From Farm Sheep, published April 1956 by University of Wisconsin Extension Service, Madison, Wisconsin

sex organs. It is also in order to inquire whether there is—or has been—any history of disease in the flock. If doubt exists—look for your ram elsewhere.

When to Quarantine

After a healthy ram has been selected and brought to your farm, keep him isolated in a pen by himself *for a quarantine period of 30 days.* During this time, watch carefully for any signs of disease. Treat for both internal and external parasites. If necessary, shear and feed the ram grain so that he will be in good condition for breeding.

The 30-day quarantine period is, in effect, a test of the ram's health. He should be added to the flock only if he remains healthy and disease-free.

Sheep taken to shows, fairs and exhibits are often exposed to disease. On their return, before joining the flock, these animals should be quarantined and treated in the same way as a newly purchased ram. If one or several animals have become infected, this handling will keep the trouble from spreading.

Keep Disinfectant Vat Handy

How many people from outside enter your sheep-yard? You can avoid exposing your animals to diseases and parasites by limiting visitors. Salesmen, rendering truck personnel, neighbors or incidental visitors can unknowingly carry bacteria or other infectious agents on their persons, clothing and footwear.

Before entering the sheep-yard, the visitors' boots or shoes should be disinfected. This precaution is easily established by the following procedure, one that is used as a matter of course on many well-managed livestock farms.

At pen or barn entrance, keep on hand at all times, a shallow metal vat containing a foam rubber mat immersed in a 5% *creosol* solution. The visitor steps on the rubber mat, automatically disinfecting the soles of his footwear. This way, the threat of infectious agents picked up enroute and remaining in mud or manure is minimized.

At shearing time, help employed—and shearers especially—should be required to disinfect footwear and equipment before entering the pens. Thorough cleansing in a 5% creosol solution or other suitable disinfectant is recommended.

How State Laws Protect

The state of Wisconsin has also moved to protect the state's flocks against disease, and to aid in disease control. Laws and regulations pertaining to sheep state that all animals shipped into Wisconsin must be accompanied by an official inter-state health certificate guaranteeing freedom from all infections and communicable

diseases. Besides the health certificate, sheep brought into Wisconsin must also be dipped *immediately before shipment* for control of scabies.

Some classifications are exempt from the above requirements. There are: (1) sheep tagged for immediate slaughter in establishments where there is U. S. Government inspection and (2) sheep imported into Wisconsin under a state permit.

Protect Feeder Lambs Too — Also Western Ewes

If you raise feeder lambs, or buy Western ewes, your handling should be much the same. Keep all animals *purchased from the same source* together in a separate unit. This way diseases can be quickly observed and controlled, and the spread of disease checked.

2. Protecting Rest of Flock from Diseased Animals

In spite of careful examination, treatment and quarantine, disease may develop in any flock. Often apparently normal sheep harbor infections or hidden diseases that flare up later. For this reason, the good sheepman *looks for disease daily,* observing each animal for signs of infection.

Healthy, strong sheep suffer less disease, and are better able to survive disease. Consequently a sound program of breeding, feeding and management is the sheepman's best insurance against disease losses. *A parasite control program* is also necessary to grow healthier, stronger sheep, and to keep disease losses down.

Vaccination against certain diseases is sometimes a necessary part of a disease-prevention program. For example, a flock where enterotoxemia has set in may require vaccination to keep this stubborn infection under control.

Isolate Sick Animals

When disease does strike, move fast to protect the entire flock as completely as possible.

1. *Isolate all sick animals immediately!* Move them to a separate pen, and call your veterinarian promptly. Once noticeably sick, sheep seldom survive unless promptly treated.

2. *Watch exposed animals closely* for signs of disease. If new cases develop, isolate these promptly too.

When disease is present in the flock, good management practice is especially important. This is a time to pay especial attention to *proper feeding,* to keep the health and strength of the well animals at a safe high point. This is a time too to observe strictest *sanitation;* the well-cleaned sheep barn helps prevent the spread of infection. In contrast, dirty premises and feeding troughs, unsterilized instruments or utensils make disease control and prevention next to impossible.

3. Getting Rid of Infections—or Holding Them Down

Control measures for specific sheep infections and diseases are difficult to prescribe. Some diseases are extremely hard to get rid of; each disease, in most cases, requires different procedures.

On the whole, good management and feeding and good parasite control are again basic requirements. Leave nothing undone that builds up the health and strength of each single animal.

Make it a practice to clean and disinfect the sheep barn (or sheep quarters) thoroughly at least once a year. Parasite (worm) eggs often live stubbornly outside the sheep's body for a year or more.

When cleaning and disinfecting the sheep barn first remove all manure. Next, scrub down the pens, walls, floors and feeders with a lye solution. Use 1 pound of lye to 15-20 gallons of water. (A pressurized steam sprayer does the job more easily.) After scrubbing, spray all surfaces with a 5% creosole solution.

The longer the barn can be left empty after cleaning and spraying, the better. A good time for cleaning is just after sheep have been turned out on pasture.

Use preventive measures for the more important sheep diseases. These are described in detail—with suggestions for treatment and control in preceding articles of this series.

Diseases of Sheep

When disease occurs, find out as quickly as possible what the trouble is.

Remember, sheep need prompt treatment! Consult your local veterinarian. He is the best qualified man in your area to make a diagnosis. Without a diagnosis, you may do the wrong thing. Many diseases act alike.

State Laboratory May Help

If your veterinarian needs specialized laboratory service or wants his diagnosis verified, he will usually refer the case to your State Disease Control Laboratory. In all cases, the Laboratory's service should be used to aid—not replace—the veterinarian.

The Laboratory will usually ask you to bring in—or ship—a dead or sick animal for examination, autopsy and laboratory studies. Sometimes, a field trip is made for additional study.

In the case of dead animals, it is important that specimens be well-preserved. Reliable reports cannot be made when material is badly decomposed.

Emphasis should be mainly on *prevention and control.* In most cases, it is far less costly to prevent disease in a flock than to treat it once disease has taken hold.

(Eighth and last article of a series.)

Why Fertilizer Is Your Best Investment

Fertilizer is a good place for every spare dollar you can spare. Read these facts and figures.

Condensed from Massey-Harris Farm Profit

Lee Schwanz

MR. average farmer last year studied the price situation, took a look at his soil moisture, then decided to cut back on fertilizer. Was it a wise decision?

Probably not, because good farmers and state college tests around the nation prove that recommended amounts of fertilizer make the most net income:

- In a normal year.
- When drouth cuts yields.
- When prices slump.
- When acreages are reduced.

Our figures in the chart on the following page show how the recommended amount of fertilizer brings more profit in each of these situations. Even when drouth cuts corn yields 20% or when prices slump to $1.15 per bushel, high fertilization brings the most income.

Mr. Average Farmer in the U.S. cut fertilizer by 4.5% last year. Corn Belt and Atlantic states farmers cut back 8% and cotton farmers 2%.

There's no doubt that fertilizer is the best investment you can make. Spend $1 to top-dress your wheat and you can expect $3 return in just 4 months. Corn, cotton and livestock farmers can expect $3 to $4 returns before winter. Your banker is happy with 6% interest on his investment; you have the opportunity to double or triple your money.

Think those figures are too high? Actually, they are conservative for farms where fertility levels are low. Indiana tests show that 40 lbs of nitrogen costing around $5 per acre may be worth an extra 5 bu. of corn on 1st-year land; 10 bu. on 2nd-year land; 15 bu. on 3rd-year land; and 18 bu. on continuous corn. Those yield increases in $1.35 corn make returns per dollar invested of about $1.35, $2.70, $4 and $5.

In a normal year figures on the charts are based on Illinois averages. With the amount of fertilizer now being used, farmers average 58 bu. With the 60 lbs.

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of fertilizer recommended, that average could be boosted to 70 bu. Profit difference is $31.20, or $385 on 50 acres.

If drouth cuts yield 20%, (chart) the man with recommended fertilization makes $12.30 profit per acre, more than twice the average. That extra return adds up to $327.50 on 50 acres.

If prices slump to $1.15 (and that's not likely in 1957), the higher rate of fertilizer still pays off. Profit per acre on average fertilization is $11.70 as compared to $17.10 at the higher rate. This time our 50-acre farmer is $270 to the good.

Apples, as the saying goes, is nature's toothbrush.

If acreages are reduced to meet allotments, fertilizer can maintain income. If the 50-acre producer is cut back to 40 acres, he makes $1,248—$83 more than on 50 acres with a lower yield. Your fixed costs go on when acreages are reduced; fertilizer is your only opportunity to fight the cost squeeze.

Take cotton, for example, where acreage is down nearly 40%. In South Carolina, yields under low fertilization run around 300 lbs. of lint per acre. With full fertilization, yields shoot to 500 lbs. As shown in our chart below, profit per acre after paying all costs was only $12 at the 300-lb rate; at 500 lbs., it was $45. Profits were more than tripled.

"Our farmers can produce the same amount of cash crops but on a much smaller acreage—and they can make more money," declares M. D. Farrar, Dean of Agriculture at Clemson College. "Higher yields per acre at a lower cost of production, per bale, per ton, per pound or per bushel, means higher net profit."

Wheat makes a fast pay-off on fertilizer. J. H. Eakin of Pennsylvania State says, "30 lbs. of nitrogen usually brings an 8 to 10 bu. increase in wheat. That's a return of $16 worth of wheat for a $5 investment."

The Missouri figures below show a net profit of $6 per acre on wheat yielding 19 bu. per acre. But when fertilizer is increased from 180 lbs. per acre to 350 lbs., yield is up to 31 bu. and the net profit to $18. A $1 investment returns $3.

Beef and milk production on pasture is easily tripled with fertilizer. In Indiana tests, applying 25 lbs. of fertilizer made 90 lbs. of beef per acre. With 300 lbs., the yield was 280 lbs. of beef. Extra fertilizer doubled costs but boosted profits 5 times.

These examples show what has been done. We can't tell you what ought to be done on your farm. You'll want to match your

fertilizer to your own soil and moisture prospects.

It is a mighty fortunate farmer who has the resources to give every crop the fertilizer it needs. However, Purdue University says you can't afford to skimp on the following, even if s e v e r e l y pinched for money:

1. Fertilization of small grains where legumes are seeded.
2. Top dressing wheat.
3. Row fertilization on corn.
4. Nitrogen fertilization on 2nd and 3rd year corn.
5. Your regular liming program.

If you have to cut back, here are the best places:

1. Fertilization of soybeans.
2. Plowing down mixed fertilizer.
3. Top dressing meadow crops.
4. Fertilizing for m a x i m u m yield.

Fertilizer is a good place for every dollar you can scrape up. Use it wisely to boost income this year.

In A Normal Year

	Average fertilization	Recommended fertilization
Corn at	$ 1.35	$ 1.35
Yield per acre	58 bu.	70 bu.
Income	$78.30 bu.	$94.50 bu.
Cost per acre	55.00	63.30
Profit per acre	$23.30	$31.20

extra profit on 50 acres $385

If Drouth Cuts Yields By 20%

Corn at	$ 1.35	$ 1.35
Yield per acre	45 bu.	56 bu.
Income	$60.75	$75.60
Cost per acre	55.00	63.30
Profit per acre	$ 5.75	$12.30

extra profit on 50 acres $327.50

If Prices Slump to $1.15

Corn at	$ 1.15	$ 1.15
Yield per acre	58 bu.	70 bu.
Income	$66.70	$80.50
Cost per acre	55.00	63.40
Profit per acre	$11.70	$17.10

extra profit on 50 acres $270

If Acreage is Reduced

Corn at	$ 1.35	$ 1.35
Yield per acre	58 bu.	70 bu.
Income	$78.70	$94.50
Cost per acre	55.00	63.30
Profit per acre	$23.30	$31.20
Profit on 40 acres with recommended fertilization		$1,248
Profit on 50 acres with average fertilization		$1,165

extra profit on 40 acres $83

(Based on University Illinois Tests)

Fertilizer	Cotton		Wheat		Pasture	
	Average	Recommended	Average	Recommended	Average	Recommended
Yield	300 lbs.	500 lbs.	19 bu.	31 bu.	90 lbs. beef	280 lbs. beef
Income	$87	$145	$38	$62	$18	$56
Cost	75	100	32	44	11	20
Profit per acre	$12	$ 45	$ 6	$18	$ 7	$36
Test State	South Carolina		Missouri		Indiana	

Why Your Cows Abort

Use this check list next time you have trouble . . .

Condensed from Jersey Journal

Jack C. Bailey, D.V.M.

SINCE there are at least eighteen possible causes, it's sometimes hard to decide on which one to blame when a cow aborts. However, an owner is wise not to spend money for remedies before he knows what is responsible for trouble.

The following list includes the commoner causes of abortion by cattle.

1. Bang's Disease. Must always be considered when abortions occur in untested herds, even on farms where a program of calfhood vaccination is being followed.

2. Vibriosis. Sometimes causes abortions in Bang's-free herds and leads to condemnation of the blood test as being inaccurate.

3. Trichomoniasis. Although usually associated with abortions during the first sixty to ninety days, it may also be responsible for those occurring in the latter half of pregnancy.

4. Leptospirosis. Sometimes a number of abortions is the only indication that this disease exists in a herd.

5. Virus abortion. May or may not be associated with a vulvovaginitis. As a matter of fact, there may be two or more of these diseases.

6. Lowland abortions. The cause is unknown, but abortions occur only when cattle are pastured on marshy areas where wild plants and grasses are growing.

7. High body temperatures. These frequently go along with diseases like shipping fever, virus diarrhea, mucosal disease, and mastitis.

8. Various types of yeasts and molds. These affect the reproductive organs and may be spread by diseased bulls.

9. Injuries. May be due to slipping on ice or fighting but much more often due to such things as jamming in narrow doorways and kicks by horses.

10. Uterine damage. When infection, delivery of a calf, or

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faulty "cleaning" has destroyed part of the uterine lining, it may afterward be impossible for a cow to carry her calf beyond a certain stage of development.

11. Artificial insemination of pregnant cows. Poking an inseminating tube through a cervical seal invites an abortion.

12. Poisoning by chemicals. Possibilities include iodides, lead, fluorine, mercury and nitrates found in medicines, sprays, seed treatments, fertilizers, and other compounds used on farms.

13. Poisoning by plants. The list of possibilities will be largely dependent on the location of the farm.

14. Starvation. Cows reproduce as a secondary activity, and will often abort if rations are poor or there simply isn't food enough for both dams and their unborn calves.

15. Excessive bleeding. Abortions result because a shortage of blood allows the unborn calves to suffocate. May follow bleeding which may result from dehorning or bad wire cuts.

16. Hormonal upsets. Since all of the hormones are interrelated, too much or too little of any certain one may disturb all the others so an abortion occurs.

17. Lethal factors. These are inherited and some of the commoner ones are "doughnut skull," "bulldog head," and "short spine."

18. Vaccination. Most often thought of in connection with the use of Bang's vaccine on females in the latter stages of pregnancy, but may also follow vaccination with any type of living organism that causes a high fever that lasts for two or three days.

Milk Meter May Solve Pipeline Problems

A meter in the milk line, which measures each cow's production with no muss or bother—that's a possibility in future pipeline milking systems, according to a University of Wisconsin farm engineer. There's even a chance that the milk meter can be linked to a feed meter to portion out the cow's daily ration electrically, based on the amount of milk she produces.

S. A. Witzel told of current University of Wisconsin research with a commercial, in-line milk meter The meter, which is being tested by Dairy Husbandmen Donald Ausman and Edward Malcheski, also removes a sample of milk from each cow for butterfat testing, he said. *—University of Wisconsin*

Birds — The Farmer's Best Friends

Ever consider what song birds are worth to you in dollars and cents? Read this fascinating article . . .

Condensed from The Rural New Yorker

Walter S. Chandler

WHAT a dreary world this would be without the birds! There would be no bird-song, no gay, colorful flashings in the foliage of bushes and trees, no busy army to protect us from the ravages of insect pests and the devastating spread of pernicious weeds.

Back in the early days, birds were killed indiscriminately. Nearly every man and boy carried a gun and shot birds at each opportunity. It took many years before men began to study the habits of birds. In doing this, they learned something about the kinds of feed birds eat.

Only after man had acquired positive knowledge of their economic value, did he begin protective legislation for the birds. It then became clear that many species of birds were very beneficial to man and should receive his protection; and, of course, no one benefitted from this change of thought more than the farmer.

Man's Dependence Upon Birds

All this has led to a deeper interest in our birds. People are no longer indifferent about the extermination of a bird species. School children, farmers, people in general are all beginning to realize just how dependent is the welfare of man upon the wild birds about us. Educational work by scientific and altruistic men and women throughout the country has influenced the thought of people in all walks of life in regard to the economic value of our wild birds.

Anyone who has studied birds, even a little, will readily recognize several classes or groups. Each of these has a special work to perform in the economy of nature.

The Cleaners of Air and Foliage

We have the cleaners of the air—the birds that feed largely on the wing, such as the swallows, martins, chimney swifts, nighthawks, and whippoorwills. They

Reprinted by permission from The Rural New Yorker, 333 West 30 St., New York 1, New York

skim above orchards, fields and housetops, sweeping the air clean of the myriads of gauzy-winged insects that come down to prey on fruit, grain, and garden crops. Were it not for this class of birds, farmers would have to do much more spraying; and garden and field crops would suffer more from the ravages of insect pests.

Then there are the foliage renovators — the birds that work among the terminal twig-tips of the trees and bushes, cleaning them of insect eggs and insects. These are the warblers and the vireos. They get the tiny insects and insect eggs that infest the outer leaves of trees and bushes. The larger birds, such as the brown thrasher, bluebird, mocking bird, wren, cuckoo, catbird, oriole and tanager, help in controlling the larger insects within the foliage of tree or bush. They, too, belong to the class of birds that take care of the foliage.

These insect eaters do a great amount of good. How much may be suspected when we remember it has been said that without the checking influence of the birds the insects within 10 years would have eaten every green thing off the earth!

Then, too, there are the seed-eaters, such as the goldfinch, junco, snowflake, grosbeak, siskin, redpole and longspur. Among the 50 or more species in this group are also the towhee, meadowlark, bobolink, cowbird, grackle, blackbird, ruffed grouse, horned lark, bobwhite, and mourning dove. Nearly all the sparrows are voracious seed-eaters.

Just how valuable to the farmers this group of birds may be can be ascertained by the fact that some kinds of garden weeds may mature as many as a hundred thousand seeds in a single season; and, if unchecked, it is quite possible for the plant and its progeny to produce 10 billion plants in the Spring of the third year. Balanced against this fact is the capability of the tree sparrow to eat more than a hundred weed seeds at a single meal, or the ability of the snowflake to eat more than a thousand seeds of the pigweed at one sitting.

Federal tax refunds on gasoline used for farming purposes are now being made on a yearly basis, with the next refund scheduled for the period between July 1, 1956 and June 30, 1957. Farmers will have a three-month period after July 1 to apply for this tax refund. Remember that records are very important.

Along with the seed-eating birds, we have the caretakers of the bark. These birds work zealously and tirelessly to thin out the great number of crawling in-

sects beneath the scaly bark of trees or homing in holes in decaying wood. Among the many birds of this group are the woodpeckers, nuthatches, brown creepers, chicadees, kinglets, and other species of like nature. These birds feed chiefly on such bark-infesting insects as ants, grubs, boring beetles, and spiders, which, because of their habits of hiding beneath scaly bark, are largely inaccessible to other birds.

Birds that Eat on the Ground

Then there are the birds that work on the ground floor—the birds that eat bugs and other insects they find while scratching among the dead leaves and in the grasses beneath the bushes and trees. In this group we find such birds as the robin, catbird, towhee, meadowlark, bobwhite, brown thrasher, and similar species. These birds feed largely on white grubs, wireworms, rootborers, cutworms, and army worms, all of which do great damage to the farmer's fruit, garden, and field crops. Hordes of grasshoppers are also destroyed each season by this class of birds. In this connection, it has been said that each meadowlark is worth far more than a bushel of corn each year to the farmer in whose fields it searches for its usual diet of grasshoppers and other insects.

One class of birds consists of our natural scavengers—the birds that fly about our forests and fields and along our lake shores and seacoasts, ridding them of putrefying animal matter. These are the vultures, gulls, and terns. They are quite beneficial birds, doing a very great service to man by keeping forests, field, and seacoast clean.

According to animal husbandmen at Purdue University, beef calves should be castrated and dehorned at less than one month of age. Native feeder sale returns indicate that calves properly dehorned are worth $1.50 more per hundredweight than horned calves of the same weight, sex and quality.

"Most Native and Democratic"

Among our common birds, perhaps none is better known than the robin. John Burroughs has said that it is our "most native and democratic" bird. Its great activity and its varied repertoire of calls and songs make it one of our most popular dooryard birds. Besides its unparalleled skill in finding earthworms, the robin feeds quite regularly on such insects as ground beetles, grasshoppers, snails, spiders, and caterpillars.

A tireless, spirited little feathered mite that frequents the roofs of woodsheds, clothesline posts, wood piles, low shrubbery, and

fence corners is the common house wren. He usually makes his appearance early in April in most sections. We say "he" because the male most frequently migrates a week or more ahead of the female. This tiny bird soon makes his presence known by his incessant chatter, which seems to pour from his throat in an endless cataract of musical explosions so intensively vibrant as to make him quiver with emotion. An exclusive insect-eater, he is certainly a friend of the farmer —a bird well worth encouraging to nest.

The catbird is another common bird that is of great benefit to the farmer. This slim, lithe bird feeds largely on garden and orchard pests, such as caterpillars, spiders, moths, beetles, grasshoppers, and the like. It has been known to eat as many as 30 grasshoppers at a single meal. It lives in low bushes and shrubbery, where it constantly searches for insects to satisfy its keen appetite. It is a great bather, not infrequently visiting the bird bath as many as six or more times during the day.

Other "Common" Birds

Another common bird of our fields which, to my way of thinking, is not getting the protection it deserves is the bobwhite or common quail—one of the most industrious and beneficial of our seed - eating, insect - destroying birds. It is a joyful experience to watch this bird in late June in the potato patch. It may be seen working through the crop systematically, going along between the rows of potato plants looking for Colorado potato beetles, which it eats voraciously. It is one of the few birds that eat this insect. Bobwhites destroy many other kinds of insects, too, as well as great quantities of weed seeds. Any farmer who shoots quail or permits others to do so is doing himself far more harm than he may think.

Although many are unaware of it, farmers have a very good ally in the purple martin. A colony of martins circling about the orchard and fields is a certain and dependable insurance against insect damage to crops. Coming as they do at the very beginning of the insect season, the martins destroy incalculable numbers of injurious insect pests while in the winged stage, before they have time to lay their eggs. These birds are one of our greatest destroyers of the curculios, a group of insects that are undoubtedly the worst enemies the fruit growers and farmers have to fight. Martins feed exclusively while in flight. They almost never are seen perched in trees or on the ground.

Among our common birds, none, perhaps, is better known than the cardinal or redbird. The

flashy color of the male bird makes him very spectacular in most any setting, while his loudly proclaimed weather prophecies of "Wet year, wet year, wet, wet, wet." But aside from these special attractions, the cardinal is of no little benefit to the farmer as a weed-seed eater and a destroyer of insects. The diet of the bird consists largely of scale insects, cotton cutworms, corn earthworms, corn earworms, cucumber beetles, coddling moths, caterpillars, and boll weevils, as well as nearly all kinds of weed and grass seeds.

Nearly 40 per cent of boys now growing up on farms are expected to seek employment off the farm when they reach manhood.

Encourage the Birds

Aside from the enjoyment we get by having birds about us at all times, attracting birds by feeding and other means has many advantages. Increasing the bird population on the premises certainly will reward us with fewer insect pests and a pleasing scarcity of noxious weeds. Then, too, if we encourage the presence of such birds as the purple martin, kingbird, mocking bird, grackle, and others of a sort of pugnacious disposition, we shall be doing much to rid our farms of crows, hawks and other undesirable pests; for these birds will do much in helping to keep such pests at a distance.

Encouraging birds to use and nest about a place is a relatively simple matter. Food, security and water are the main things to consider. It must be remembered, too, that cats and dogs are inimical to the welfare of wild birds; the two just simply do not get along well together. Putting up bird houses, supplying suitable nesting sites, providing water for drinking and bathing, and setting out trees and shrubbery suitable for supplying foods and shelter for the birds—these are things of greatest importance in attracting birds to any given locality.

Fluid Milk Sales to Increase

Increased industrial development and increased consumer income will strengthen fluid milk sales, which have gone up the past five years. In 1956 sales were up about 10% over 1955. The number of milking herds will probably remain constant but the number of dairy cows per farm will probably increase. Milk prices will remain practically the same, with slight increases in isolated areas.

Law on the Farm

By Norm Krausz

Sixth of a series on farm law by Norm Krauz of the University of Illinois Extension Service. Articles are prepared with Illinois conditions in mind. Laws in your state may differ.

Rules of Surface Drainage

A landowner can do certain things to improve the drainage of surface waters on his land. He can:

1. Widen, deepen and clean natural depressions that carry his surface water.

2. Straighten out channels on his own land so long as he does not change the point of entry on lower land.

3. Accelerate the flow of water if in the interest of good husbandry.

4. Drain ponds or depressions in the direction they overflow.

5. Use tile for better drainage.

6. Fill up low places and force the water into channels.

7. Construct grass waterways, check dams and terraces.

There are also rules to prevent a landowner from making certain drainage changes. He must not:

1. Dam or obstruct a natural channel so as to back up surface water on a higher farm.

2. Divert water to lands that do not naturally receive his drainage.

3. Change the point of entry of surface water on lower land.

4. Bring in water from another watershed and discharge it on the lower farm.

5. Release a large body of water from a dam or pond at one time.

6. Connect tile with the neighbor's tile or with highway tile without consent.

7. Pollute any water that passes from his farm to another's lands.

Public roads are in the same position as if the road were farmland. That is, these same rules apply — with one important exception. If the highway commissioner or other highway authority can show that the roadway would be damaged by natural drainage, then these officials have a right to make changes. However, in such cases the farmer whose land is injured has a legal right to compensation for the injury.

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How To Become a Top Hog Man

You can profit by these experiences, described by Iowa's Master Swine Producers . . .

Condensed from
National Livestock Producer

COULD you save an average 12.4 pigs per litter from 15 sows and market them at 165 days of age weighing 204 pounds? This remarkable record was achieved on the 1956 spring pig crop by Marvin Hirsh, a young tenant farmer of Storm Lake, Iowa.

Hirsh said, "When my sows came through last spring with such good litters, I just tried to do the best job I could with my hogs as I have always done. I gave little thought to the idea of making such a record."

The number of hogs raised to market weights is a major factor in choosing a Master Swine Producer and Hirsh's record certainly entitles him to that honor.

The Iowa Master Swine Producers project was established in 1942 and marked its 15th consecutive year in 1956. Its purpose is to recognize each year the top 25 hog producers and to encourage efficient hog production.

The results speak for themselves. In 1942, Master Swine Producers marketed an average 8.1 hogs per litter as compared with an average 9.87 hogs per litter in 1956.

Hirsh's outstanding record began with brood sow selection. "In 1955, I had 31 sows," he explains. "Hog production was not too profitable that year and I planned to cut down. So I picked out 15 of the best sows with 12 to 14 teats; sows which had been good mothers. These good hybrid sows produced their third litters in 1956."

In swine production the managerial ability of the hog producer, more so than any other factor, determines the profit or loss of the swine enterprise. Raising exceptionally large litters such as Hirsh did takes a bit of luck but raising large litters to market weights year-after-year takes more than luck.

Hirsh Set New Record

Hirsh's record of pigs marketed per litter from all his sows farrowing between December 1 and June 1 was the highest of all

Reprinted by permission from National Livestock Producer, 139 N. Clark St., Chicago 2, Illinois

the 375 master swine producers honored in previous years.

Only two hog men in the 1956 project marketed 11 pigs per litter. There were 13 who marketed 10 or more hogs per litter and eight who marketed between 8.5 and 10. Cyril Hauser of Williams, Iowa marketed an average 8.9 hogs from 59 sows—the largest number.

Two Scotchmen bet a shilling on which could hold his breath the longer. There was a double funeral.

The test of a good hog producer is his management of pigs from birth to weights of 50 to 60 pounds. Pigs that get off to a good start are already half way to market. Hirsh, and the other swine producers, did an outstanding job in handling the sows and getting pigs off to a good start. None of these hog producers resorted to artificial milk for pigs.

"My first three sows farrowed 17 and 18 pigs each," reports Hirsh. I divided the litters on a couple of the sows and let nine nurse, then another nine. My wife did not see much of me during the critical farrowing period."

Some of the pigs from the largest litters were shifted to smaller litters to even-out the workload. Hirsh did not use farrowing stalls but he will have them in the hog house on the farm to which he is moving this spring. Of the top 25 hog men, 13 used stalls.

Eugene Lindaman of Aplington, Iowa asserts: "Stalls will save an extra pig in every litter. I would never consider raising pigs in the winter without the use of stalls."

Hirsh washed his sows before farrowing and scrubbed the pens with hot lye water. To prevent anemia he used the old reliable practice of providing clean sod dirt in the pens and he had plenty of that on the 240-acre farm which he rented. Most of the producers used reduced iron tablets to prevent anemia.

Scours bothered most of the hog producers. There was nothing too specific about their control or prevention of scours except they practiced cleanliness in the pens, avoided chilling of the pigs and were careful about the feeding of the sows. One or two used antibiotics to control scours.

Charles Stephens of Montezuma, Iowa had the highest average daily gain of 1.44 pounds daily, made by an average of 10.6 hogs marketed from 12 sows. His pigs were produced by sows of Hampshire-Berkshire and Yorkshire crosses mated to a Duroc boar. Hirsh's average daily gain was 1.25 pounds while the average for the whole group was 1.20 pounds daily.

In comparing rate of gain in

1956 as compared to 1942, there was little difference. This might be due in part to the fact that the 1956 hogs were marketed at a younger age, when the daily gain is not quite as high as with the older pig.

Raises Pigs in Confinement

Stephens raised his pigs on alfalfa pasture while Hirsh raised his in confinement. Hirsh had a semi-monitor type of farrowing house with watering facilities inside. He had no pasture. He said, "It took a little more labor but at that, it was the easiest way for me to handle hogs."

Records in western states show that farm windbreaks can save $350 a year in fuel bills.

Clinton Cooper of Hartley, Iowa had a concrete feeding layout so that he, too, felt it was easier to raise his hogs inside. Last summer because of poor pastures due to heat and drouth, hogs in many instances did better in confinement.

The rations fed by these producers, especially to young pigs had a great bearing upon the livability of the pigs in such litters, even though the rate of gain of 1.20 was no better than that of 15 years ago. At least 23 of the producers started their pigs on either pre-starter or starter feeds provided by commercial feed companies. Two producers used rolled oats. The formulas for the starting feeds were similar to those recommended by Iowa State College. In fact, Hirsh used the college formula. None weaned under 5 weeks of age, the average being about 7 weeks.

Oats figured prominently in the after weaning rations. Stephens used a mixture of 1,200 pounds corn, 800 pounds oats and 300 pounds of commercial supplement . One-fourth oats and three-fourths corn was a more common proportion of these grains. Most of the producers reduced the oats as the hogs became older.

Producers are Improving Quality

Henry Verburg of Sheldon, Iowa raised his hogs on a complete feed ground and mixed commercially. He started the pigs on an 18% pig starter and kept reducing the protein content, ending with a 10% protein level.

Hog producers are extremely conscious of the fact that they must improve the quality of their hogs to meet the market demands. That progress is being made both as to the type of hog and the weight at which the hogs are marketed. Of the top hog men, 17 sold hogs on a graded basis while eight sold straight.

Hirsh sold the first two lots of hogs at a local packing plant and was paid 25c above the top price for the day. Hirsh felt he

had better hogs than that so the next lot of 37 was sold on a grade and yield basis. This lot yielded 69.43% and brought him 57c per cwt. above the live weight price. The last lot sold on the same basis, yielded 71.70% and brought him 85c per cwt. over the price on foot.

Jack Klopfenstein, West Point, Iowa, sold 130 head grading as No. 1s. Clinton Cooper of Hartley, Iowa sold 164 head of which 120 graded No 1s, 42 No. 2s, and 2 No. 3s. Leon Haahr of Newell, Iowa sold 114 head of which 112 were No. 1s and 2 No. 2s. Harry Northrup of Ellsworth, Iowa sold 218 which brought 26c to 53c per cwt. above the going price.

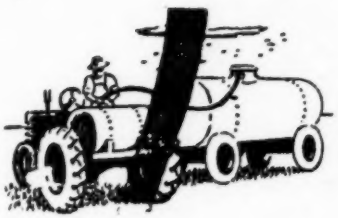
The great change taking place in hog marketing, as evidenced by the practice of these top producers, is the topping out of hogs as they reach desirable market weights. Clinton Cooper marketed at 12 different times locally.

These Master Swine Producers represent top managerial ability and their records may be summarized as showing definite trends in swine production as follows.

- Definite progress is being made in the improvement and selection of breeding stock in prolificacy, type and feeding quality.
- Cross breeding has been on the increase and is practiced very generally. All 25 of the 1956 group practiced cross breeding.
- Larger litters are being saved through the use of heat lamps, farrowing stalls and the use of better quality pig starters.
- There is a definite trend to more confinement feeding of hogs.
- Producers are feeding with market trends in mind and topping out their hogs at popular weights.
- Selling on grade and yield is on the increase in Iowa.

Dairy Heifers Need Less Grain

In feeding tests at Beltsville, Md., dairy nutritionists have found that dairy heifers need no more than 460 pounds of concentrates to attain normal growth from birth to first calving if they are fed a variety of high-quality forage rations. In these tests, milk feeding of heifers was successfully discontinued at 60 days and grain feeding at 9 months, which goes to show, the dairy nutritionists say, that the use of large quantities of high-quality hay in dairy-heifer rations can materially reduce the cost of rearing dairy herd replacements.



Liquid Fertilizer

It costs about the same, but you can't beat it for convenience . . .

Condensed from The Furrow

Ralph Hughes

THERE'S one sure way to make corn planting easier and faster next spring: Use liquid fertilizer.

How Much Easier?

Louis Strasburger of Earl Park, Indiana, planted 340 acres of corn this year and applied 200 pounds per acre of 8-24-0 liquid fertilizer as a starter solution. There's no doubt in his mind that turning a spigot off and on is much easier than carrying 34 tons of dry fertilizer in 80-pound bags.

Paul Wise of Tiffin, Ohio, also vouches for the ease of handling liquids: "No one can realize without actual experience how much labor is saved through the use of liquid fertilizers."

How Much Faster?

We asked Art Riefle of Fowler, Ind. He answered: "I've got corn rows three-quarters of a mile long and with dry fertilizer I had to fill up at each end, but with liquid, I can make the trip down and back with some left splashing in the tank.

A. J. Ohlrogge, Purdue University agronomist, says liquids save time because they are concentrated: "For instance, a 100-gallon tank of 10-10-10 is enough to put 200 pounds per acre on 5 acres of corn without refilling the tank. This is a big improvement over filling the hopper at each end of the field with dry fertilizers. Farmers like this easy way of getting plant food onto their fields, faster."

Additional Advantages

George Freeman of Sumner, Iowa, prefers liquids because he obtains a more uniform distribution of plant food in the soil. He also prefers liquids because they are soluble and absorb quickly.

Melton H. Brown, agronomist at the University of Missouri, made the following observations: "Mixed liquid fertilizers are being made in a wide range of formulae, up to 30 pounds of available plant food. This is an important point to consider when freight and cost of plant food

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per pound are concerned. The material has no pressure and is not offensive or especially dangerous to use.

"Results have not shown much difference between mixed liquid fertilizers and solids of the same analysis," concludes Brown.

Liquid vs. Dry Fertilizers

The results of tests with liquid fertilizer in Ohio and Indiana show that complete liquids, if properly applied, are as good as dry fertilizers, but no better, according to Agronomist Earl Jones of Ohio State University.

In a demonstration conducted in north central Iowa in 1955, dry 13-39-0 applied as a row fertilizer with corn at planting time increased corn yields 14 bushels. A like amount of nutrients from liquid 8-24-0 applied 2 inches below and directly under the seed gave a yield increase of 15 bushels. The one-bushel difference is not significant, but the test does indicate that a starter fertilizer makes a difference of whether it is a liquid or a dry material.

Is Cost A Factor?

Soil specialist Art Peterson of the University of Wisconsin has a rule-of-thumb for buying fertilizer in the Badger State: "A pound of nitrogen should cost about 15 cents, a pound of phosphate about 10 cents, and a pound of potash about 5 cents."

Using this guide, one ton of 9-9-9 liquid fertilizer should cost $54 and one ton of 10-10-10 dry fertilizer should cost $60. Last summer retail outlets in central Illinois had quoted the following prices for one ton of each of these two fertilizers at $58.90 for the liquid and $67.20 for the dry —both prices being higher than the rule-of-thumb measure. However, when comparing the cost per pound of actual nutrients, the two fertilizers are priced about the same, around 11 cents.

J. A. Stritzel, extension agronomist at Iowa State College says, "The present price quotations show the cost to the farmer to be about the same per pound of actual nutrient. Therefore, the choice of using the liquid or dry materials rests primarily with the convenience in handling one or the other."

The livestock industry appears to be nearing a period of unusual progress, marked by more efficient use of feed, says the U. S. Department of Agriculture.

There are, naturally, other factors having a bearing on the matter — equipment, for example — but if the choice between liquid and dry fertilizers boils down to a matter of convenience, the answer is simply that it's hard to beat the case of handling liquid fertilizers.

Roll Up Your Irrigation Ditches

New gated plastic pipe is easy to move, maintain, or adapt to problem fields . . .

Condensed from Capper's Farmer

George Beshore

LIKE to roll up your irrigation ditches and move them clear off the field until the plowing's done? That's exactly what farmers from Nebraska to Texas are doing now with Flex-Flume — a gated plastic pipe that makes an excellent irrigation "ditch."

When not in use, it can be rolled up like a garden hose and stored in the barn. Another advantage it has over ditches is that it doesn't wash out. This angle appealed especially to William Anderson of Buffalo county, Nebraska.

"I had one ditch that was especially hard to hold," he said. "Sometimes it would go out soon after I had started pumping. Of course I had to shut the entire system down and repair it."

Anderson replaced the ditch with flexible pipe. He uses the plastic pipe mainly for watering on slopes where washouts generally occur. Meanwhile, he still uses his ditches to irrigate his flat fields.

Cecil Wolford, another Buffalo county, Nebraska farmer, uses a smaller amount of flexible pipe the same way. His well is on a ridge, supplying irrigation water for two 80-acre fields. Dams were required where the ditch ran down the steepest part of the slope.

So last summer Wolford bought 400 feet of gated flexible pipe. He irrigates 25 acres of corn on each side of the ridge with this. Short laterals, called "socks," take the water from the plastic pipe into the corn rows which are on the contour.

At the same time the pipe carries water down to the flat part of the 80's. There it is dumped into ditches which water the remaining 55 acres on each side of the well.

Last summer was the first season the flexible pipe was sold in Nebraska. However, it had already been used on farms in Texas and Louisana for 3 years.

Still a new product, flexible pipe is sold with a flat 3-year guarantee. However, manufacturers expect it to last 8 or ten years in actual field use. It is

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adapted only to gravity irrigation because it isn't being built to withstand the higher pressures under which sprinklers operate.

Many central and western Nebraska farmers—who had been irrigating for years—had well-established ditch systems. They, like Wolford and Anderson, have bought limited amounts of flexible pipe to meet special problems.

Other farmers who are putting in new irrigation systems often bought enough for their entire needs, investing in pipe instead of ditching equipment.

There are several reasons for this. Pipe eliminates weed and other maintenance problems common with ditches. Also, fields can be cultivated all the way to the edge because you don't have to leave room for a ditch.

A major item is elimination of evaporation and seepage losses in the ditch. These may run as high as 25 to 40 per cent. Eliminate them and you cut pumping costs substantially. This will pay for the pipe within a few years.

"Any kind of pipe will pay for itself within five years by cutting down pumping costs," declares M. R. McClemens, irrigation specialist at Kearney, Nebraska.

Big feature is the ease in moving. Anderson pre-irrigated 48 acres last year. He took up the pipe and planted sugar beets, then laid it down again and irrigated the crop. He took it up twice more to cultivate.

Moving it was simple. He mounted a reel on his pickup truck, then drove along the pipe, uncoupling it in 100-foot sections. Each was reeled onto the truck as he went along.

"That made moving the pipe easy," he commented. "And that, in turn, made it easy to farm the field."

Systemic Poisoning of Cotton Pays

Systemic treatment of cottonseed for the control of early-season insects paid off for a Refugio County, Texas, farmer.

Otto Kenne of Woodsboro last year got encouraging results through use of systemic poisoning of cotton. He harvested 333 pounds of lint cotton per acre from systemic-treated acreage. The average yield from untreated cotton was 294 pounds per acre. Kenne said he also noted a reduction of aphid damage on the treated cotton.

Small test plantings were made at widely separated locations in the Coastal Bend last year. The general consensus was that systemic treatment of seed gives fair control of early-season cotton insects for a period up to seven weeks. —*New Mexico News*

New for You . . . THE EDITORS

To Feed or Not To Feed is a question many farmers ask themselves when deciding to supplement poor roughage with grain. When roughage runs low the temptation is to skimp until pasture season. This is a poor guess. Milk production lost this way can not be regained in the present lactation regardless of how much grass the cow gets on pasture.

A New Farm Profit Meter designed by Professor Leonard Schruben, Kansas State College, facilitates feeding adjustments. It has charts for adjusting feeding ration for beef cattle, hogs, sheep and poultry as well as dairy cows.

Green Feeding Twice Daily is growing rapidly in popularity in Wisconsin. F. W. Duffee and M. F. Finner designed a wagon to be loaded in the field directly from a forage harvester. When pulled to the feeding area, cows eat directly from the wagon which has a shallow feed manger and stall partitions to cut down waste. Rack is 14 ft. long with six stalls on each side providing feeding space for 30 to 36 cows. Plans for self-feeding wagons for different herd sizes are available from the Agricultural Engineering Department at University of Wisconsin, Madison.

Sheep Shorn Swiftly, Solely and Safely . . . The Service Department of the New England Shepherd at Sheffield, Mass., will give you details of the best news for the sheep industry since the discovery of phenothiazene. Sunbeam Corporation's new table allows the newest shearer to learn on two or three sheep. While the sheep is firmly clamped down, the fleece comes off in one piece to rest on the table and floor. Any kind of shearing equipment can be used.

Don't go to pieces when the bomb goes off . . . Check your Geiger counter instead. Guy W. Mann, director of the New England Livestock Association, predicts every American farmer will have his own Geiger Counter. He says the only way a farmer will be able to tell if his animals and their products are contaminated by radioactive fall out, after an atomic attack, will be to monitor them with his own instrument.

Pay As You Spray . . . John Bean Division, Lansing 4, Michigan, has two all-new, drawbar mounted general purpose farm sprayers. The 50 gallon tank with anti-corrosive coating is designed to fit with quick attachment to

3 point hydraulic hitches. The extreme maneuverability of this part of the-tractor-instead-of-a-trailer-sprayer will help pay the way with easier handling.

Surplus Milk Dispenser . . . All dairymen agree that convincing the public to drink more milk would help dispense the milk surplus. A home dispenser with two 3 gallon cans, consisting of a self-contained refrigerator unit, stainless steel interior, lift-type dispensing valve and $115 price looks very promising in University of Idaho tests. Similar to commercial designs used in restaurants for the past ten years. Tests by housewives show encouraging acceptance. Its basic advantages of keeping milk colder continuously, keeping milk as available as water, and keeping enough on hand to prevent running out have shown increased milk use in some homes of 100%. More of this kind of device might be healthier for both the kids and the dairy business.

Speaking about the year 2000, a learned scientist told his audience, "The sea will be farmed for foods, such as algae. Farming on land will be so mechanized that computers will do the programming and machinery the work of planting and harvesting."

Sales Per Acre of Farmland

Figures now available tell the amount of farm products sales in terms of the land in farms for various States. These figures are influenced by the amount of cropland or woodland in a particular State and selling price of the products as well as the intensity of production must be considered.

For West Virginia, Census figures show sales of $12.30 per acre of farm land. This compares with $11.13 in South Dakota and $12.91 in Texas. Mid-western States, which have a high percentage of cropland in farms, had higher average sales. Iowa had $60.83 and Illinois averaged $56.36 per acre. In Pennsylvania, the comparable amount was $68.49. New England, which is about three-quarters forest land, averaged $67.61 sales per farm acre for all six States.

—West Virginia Extension

Are You a "Cow Man?"

An artificial breeding association asks its members these sometimes amusing questions.

Condensed from COBA News

WE often hear that "what-chacallit" is a good "cow man." What makes a man this way? Here are a few things good cow men have in common—

1. They never hurry, hit, or holler at a cow. A scared cow and a scared jack rabbit give approximately the same amount of milk. They treat the cow like an animal—not like a machine in a milk factory.

2. When they milk, they milk. The machine comes off, always, when the cow is milked. It isn't yanked off so the teats snap like a rubber band, either.

3. They are reasonably regular in their milking times.

4. They find out what they need to put in the front end to get milk out of the bottom end —and they put it there—if they have it.

5. They feed dry cows and heifers as though they were going to milk eventually and don't discount them because—for the time being—they aren't milking.

6. They do all they can to make Bess comfortable. No lice, plenty of bedding, reasonably warm, plenty of water, plenty of light, and some folks are even giving her 4 feet 7 inches stanchion room which she needs. Ventilation, too.

7. They watch for foot rot, milk fever, cattle scab, scratches, etc., and try to do something for their ailing charge or get Doc to help out.

8. Most good "cow men" have to dry off old Bess. Otherwise old Bess takes care of it herself. Good "cow men" keep cows milking and never take the chance that causes a drop. Chances like

(a) Cows huddling up in the winter cold, wind and snow.

(b) Using a cow-dog that can not be called off.

(c) Running out of grain on

Reprinted by permission from COBA News, published by Central Ohio Breeding Association, Columbus 4, Ohio

Sunday morning at 5:45 a.m.

(d) Leaving the barn door unlatched on January 10th at 6:30 a.m.

Yes, the big thing that makes a man "a cow man"—is that he can get and hold production up on each cow. It isn't easy to be a good "cow man"—but it is more profitable. Most "cow men" are born in the same manner as "poor cow men" and have learned how to care for cows for production.

Too Many Potatoes Forecast from '57 Crop

It looks like there'll be too many potatoes in the United States next season if growers follow their present intentions, says Arling C. Hazlett, University of Maine. The 1957 national potato acreage will be one per cent larger than that planted in 1956. The total acreage, based on March 1 intentions of late summer and fall crop potato farmers, as well as intentions and actual plantings reported previously for producers of the earlier potato crops, would be 1,420,800 acres.

The two per cent reduction in acreage indicated for the late summer and fall potatoes is more than offset by increases in all of the other seasonal potato crops, points out Hazlett. Plantings of the relatively small winter and early spring crops are one-quarter, or 16,000 acres, larger than the crop planted in 1956. Growers of late spring and early summer potatoes have reported intentions of planting 3 per cent, or 9,000, more acres than was planted in 1956.

In marketing guides issued by the U.S.D.A., growers were asked to reduce 1957 plantings to a level 5½ per cent below that of the year earlier. If growers in each state follow the acreage guide and the yield in 1957 is the same as for the four years 1953-56, the resulting crop would be about 213 million hundredweights. This is a quantity which the USDA feels can be marketed to return growers reasonable prices, Hazlett says.

—University of Maine

Farmers Like Bulk Coolers

Three years of experience in Michigan show they pay off in efficiency, convenience and savings in labor . . .

Condensed from Electricity On The Farm

Richard Smith

THE FIRST bulk milk tank coolers were installed in St. Clair County in southeastern Michigan about three years ago. Since then, additional bulk milk coolers have been installed in increasing numbers as merits of the equipment became evident.

Dairymen have been attracted to this system by one or more of the following considerations:

- A desire to take further, progressive steps in modernization and mechanization.
- The necessity to replace obsolete, inadequate or worn-out equipment.
- A chance to ease the drudgery of old-style milk handling methods as well as to reduce man-hours of labor.
- Premiums paid for bulk-handled milk.
- Lower hauling costs.
- Less shrinkage in handling.
- On-the-farm milk measurement.
- Protected milk storage during periods of storms, strikes and other emergencies.

Proper Size Tank Important

Bulk tank size is based upon quantity of milk produced and frequency of pickup. Tanks selected are usually large enough to hold three milkings for every-day pickup and five milkings for every-other-day pickup. The tank must hold all the milk produced during peak production periods. When any great expansion of herd size is contemplated within the next eight or ten years, the tank size selection should also be based on such planned growth.

Regardless of size selected, the bulk cooler is a much more efficient method of handling milk than the can cooler. In effect, it is doing away with the well-known symbol of dairying—the old milk can. Practically speaking, of course, it merely replaces the can cooler. It is another change that has come about with modern day mechanical progress.

But the addition of a bulk milk tank immediately means less work for the dairyman. The job of loading milk cans for hauling to the dairy plant is gone. This is

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done with an electric motor which pumps milk from tank to transport truck. And there are no empty cans to be washed, stored and handled.

No Lifting with Pipelines

When bulk milk tanks are coupled with properly installed pipeline milkers, a closed system of milk handling is provided. No manual lifting or carrying of milk is required in any part of the operation. Milk flows through sanitary pipes from cow to tank and from tank to truck transport. It also practically eliminates any chance for contamination. Once into storage, the tight fitting covers and capped ports prevent contamination of the contents by flies, dust, sneezes or coughs, or other foreign objects.

Use of pipelines also permits the operator to remain with the milking machines throughout the milking period. He no longer needs to wait for cans to fill and then to transfer strainers from can to can as the cows are milked.

All are Happy with Investment

The Michigan dairymen which were visited have all found their bulk tank systems save labor and offer much more convenience and efficiency than the methods they formerly used. They are all satisfied that the investment was worth-while. To them, it was another important step in mechanizing their dairy operation.

Dairy Ration Self-Fed Not in Balance

A balanced dairy ration is next to impossible to control when self-feeding silage, claims C. F. Huffman, dairy researcher at Michigan State University.

The solution, he says, is a modification of the self-feeding program. Then, of course, it is no longer self-feeding.

The problem is that dairymen have no control over the cows' silage or hay intake when self-feeding. This is an important consideration, especially with high producers, he says.

Unless you know what the cow is eating, and how much, it is next to impossible for you to balance the ration with protein supplement and home grown grain.

When silage is self-fed, it is also important for dairymen to keep their animals away from silage for two hours before milking time. If he doesn't, milk off-flavors can develop.

—*Michigan State University*

Soon You'll Really Grow Tall Plants

A report on the amazing new growth stimulator — gibberellic acid . . .

Condensed from American Vegetable Grower

IN THE Orient, rice is often infected by the "foolish seedling" disease. Plants grow very rapidly at first, then die.

This intrigued the Japanese over 19 years ago. Working with *Gibberella fujikuroi,* the fungus which caused the disease, they isolated a colorless crystalline substance called "gibberellin A," which was responsible for the rapid growth, but not for the death of the plants. Later another gibberellin was isolated from the same fungus and was named gibberellic acid. Both compounds have identical growth-stimulating effects on plants.

Only within the past year has there been extensive work in this country on the effects of gibberellic acid on commercial crops. Vegetable crops are affected in several remarkable ways.

1) Dwarfism in many crops is eliminated. Bush beans (both snap and lima) develop twining vines and climb like pole beans. Dwarf peas grow taller than the tall varieties. Increases in heights of 400 to 600% are common.

2) Gibberellic acid primarily stimulates top growth and not roots. With celery, a remarkable elongation of the leaf petioles and more rapid over-all growth occurs under field conditions. Fresh and dry weights of tops may be increased as much as 50% within two weeks. Spinach shows a similar response if grown in short days and at cool temperatures. Greatly increased growth in cucumbers can be seen in five days.

3) Gibberellic acid shortens the time to flowering and speeds up maturity in bush-type snap beans and dry shell beans. Flowering is consistently two to three days earlier, and seed maturity up to a week earlier. This should hasten the breeding of new varieties, as well as enable earlier

Reprinted by permission from American Vegetable Grower, Willoughby, Ohio

harvest and marketing of certain crops.

No effects of the chemical have thus far been apparent in the progeny of seed (lettuce and bean) from treated plants.

4) Several annual vegetable crops such as lettuce, radish, and spinach, when grown under long days (14 to 18 hours of light daily), flower and produce viable seed three to five weeks earlier. Seed production in Great Lakes head lettuce has been hastened by 31 days. Treated plants produce seedstalks and flower without forming heads. The mechanical barrier of the head is completely eliminated.

5) Certain biennial crops such as carrots and beets may be introduced to flower and produce seed several months earlier. Treatment with gibberellic acid enables these plants to completely by-pass the normal cold treatment for flowering. This discovery is highly significant in developing new varieties and in seed production.

6) Fruit setting is stimulated in the tomato without pollination. Sprays of gibberellic acid applied to the flower clusters are effective in concentrations ranging from 10 to 1000 ppm. Fruits are normal and no injury to the plant occurs. Preliminary experiments indicate that cucumbers and eggplant respond the same as the tomato.

7) Seed treatments promote earlier germination in peas and beans, especially at low temperatures. Growth of seedlings from treated seed is also stimulated.

Gibberellic acid may be applied to plants as a very dilute spray or as a small droplet placed on the growing tip. It is absorbed by the roots if it is applied as a soil drench or added to solution cultures. Finally, it may be applied as a seed treatment. Very small quantities are effective.

Many factors affect the responses of plants to gibberellic acid. Fastest growth results with optimum conditions of temperature, light, and mineral nutrition. Maximum yields of treated crops will not result, except where adequate fertility levels in the soil are maintained.

Crops may be treated at various stages of development, but as the plant matures, the response to a given dosage decreases.

The only source of the chemical now is the disease organism from which it derives its name. It probably occurs naturally in many vegetable crops. Three large producers of antibiotics (Merck & Co., Eli Lilly & Co., and Chas. Pfizer & Co.) now have small quantities available for research purposes.

Much detailed and extensive field testing is needed before growers will realize the full benefits of gibberellic acid.

"Rainmaker" Tells About Weather Engineering

The country's best known rainmaker tells how it's done and forecasts a bright future for weather control . . .

Condensed from The Young Farmer

An interview with Dr. Irving P. Krick, president of the Water Resources Development Corporation, a prominent rainmaking company with 100,000 farm clients and 41 million acres of land under contract.

Dr.Krick, can you tell us about your business in a few words? You have attained a prominent reputation as a "rainmaker"—just exactly what does that mean?

The term "rainmaker" is apt to be misleading. No one can cause clouds to form and make it rain; we must work within the framework of natural storm occurrences. We disperse suitable materials into cloud formations to precipitate greater amounts of moisture than the natural dusts and soils that operate to produce natural rainfall. In a sense, we are fertilizing the clouds with chemical substances to increase the water yield, just as the farmer fertilizes the soil to increase his crop yields. We are able to do this because during natural rainfall, only 2 to 5% of the moisture passing overhead in the clouds reaches the ground as rain or snow.

How do you personally refer to your operation—if not as "rainmaking"?

Rather than rainmakers, we prefer to be called "weather engineers" because we have applied engineering principles to the art of cloud seeding to modify or improve the weather for the benefit of mankind. We can currently increase rainfall or snowfall to augment soil moisture and reduce the incidence and size of hailstones to reduce crop damage.

Another basic phase of our activity is the development of long range weather forecasts. These procedures recently have been adapted to high-speed, electronic computing equipment to improve the dependability and usefulness

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of such information to agriculture. With forecasts of frost dates and general temperature and precipitation trends for a month, a season, or even a year or more ahead, agriculture can begin to reduce the gamble which the weather factor has always injected into this activity.

How long have you been working with weather?

My work with weather began in 1931 when I undertook graduate work at the California Institute of Technology. In 1933, Dr. Millikan, President of Cal-Tech, appointed me head of the newly formed Department of Meteorology. It was here that we evolved methods of long range weather forecasting which I adapted to the needs of the Military establishment in World War II. More recently we have improved their dependability thru an adaptation to high speed, electronic computers.

We are most interested in the agricultural aspects of your operations, of course. What, exactly do you offer the farmers? How do they sign up for your service?

When a farm group decides it would like to investigate weather modification to increase moisture or to reduce hail damage, we send one of our representatives into their territory to ascertain the extent of their interest and to help them organize a program. Usually key people and leaders in one to five county areas meet with this man. If sufficient interest is generated, plans are actively implemented to organize the county or counties into a non-profit association to do business.

How is such an operation financed?

If the program goes ahead each county is broken down into districts such as townships, or whatever the most appropriate local situation dictates. In each division, local people help in the fund drives to provide the financing to proceed with a contract for actual operations. During such organizational periods we assist the local people in holding educational meetings, to address business and service clubs, high school and church groups, farm organizations, and to address the general public over the radio or TV and through the newspapers.

What would such a program cost the farmers?

The costs of cloud seeding are small compared to the economic benefits. Usually an annual program will run between 3 and 5c per acre for projects exceeding one million acres. Independent economic studies reflect benefits to cost ratios of approximately 100 to 1 in good farm production

areas. This will be somewhat lower in marginal regions and higher in the most productive sections of the country. Hail suppression benefits are even more spectacular. We have protected many millions of dollars worth of crops from major hail damage in the last several years in this country and in Canada.

How many farmers do you have under contract this year?

There are approximately 100,000 farm participants in our projects this year. This includes 20 operational areas extending from California through the midwestern states, into Florida and Georgia. The land area operated comprises 41 million acres. This is an increase over previous years.

Dr. Krick, sooner or later we have to get down to the basic question—can you really make rain?

We cannot make rain in the sense of producing clouds and then precipitating the water from them. There are some instances where cloud formations are on the verge of producing rainfall and by cloud seeding techniques they can be "triggered" to yield their moisture. This is the closest we can come to "rainmaking" in the strict sense of the word. The greatest economic benefits from our work occur in broad storm situations where it is already raining and we effectively augment the yield of water from the clouds. This increase in precipitation varies from a few per cent in marginal cloud seeding opportunities to over 100% in more favorable situations.

You mentioned hail prevention a moment ago. How can you prevent hail from falling?

Hail prevention is a new and important phase of weather modification. By spreading silver iodide through the rising currents that supply moisture to hailstorms, super-cooled (at temperatures below freezing) water in the cloud is turned into harmless ice crystals before it can freeze and form solid hailstones. This is one of the more spectacular aspects of weather modification and one which can be evaluated by eye observation. Inside defense zones little or no hail occurs, whereas outside very violent and severe hailstorms may be occurring. In one project in Canada in 1956 no one inside the project suffered a complete crop loss but all around it whole sections were completely hailed out.

What about snow? Can you affect that?

In addition to increasing rainfall, cloud seeding will also increase snowfall, so that the water put in storage for subsequent use during the summer and spring

runoff period can be substantially increased. Such operations are underway for hydroelectric power companies and irrigation projects in many parts of the western United States, Canada, Europe and Africa.

What is the principle behind your operation—just how do you get rain or snow to precipitate out of a moisture laden cloud?

Cloud seeding consists of injecting artificial nuclei into rain clouds which will stimulate the rain process more efficiently than the natural dusts and soils which perform this task in nature. Silver iodide is the substance most commonly used in broadscale operations. In super-cooled clouds it will form tiny ice crystals which grow rapidly to snowflakes and fall out of a cloud much faster and effectively than the dusts and other natural nuclei in the atmosphere. Silver iodide taps the moisture in the lower, wetter portions of a cloud left untouched by natural nuclei, thus adding substantial amounts of rain to that falling from the upper portions of the cloud where the latter are operative.

How do you get the silver iodide into the clouds? How can you tell how heavily you must "seed" the clouds?

Through a long series of field investigations, we learned how to disperse silver iodide in the right quantities, at the right time, at the right place, to precipitate additional moisture on our project areas. This is done by dispensing it from ground-based vaporizing units which inject the material into the air streams which are carrying moisture to storm clouds. We let nature carry along our materials in addition to the substances normally transplanted to the clouds by the upward moving air currents which are present during all active storm occurrences.

How do you know in advance when the right weather and wind conditions are coming along for your operation?

These operations are controlled from our Weather Central in Denver, Colorado, to which all current weather observations are transmitted over the government teletype circuits. Our company is licensed to receive this information and it forms the framework within which all computations are made resulting in the transmission of field orders to our generator operators. We maintain a watch on the weather 24 hours a day, seven days a week, over the entire North American Continent and the adjacent oceans, and are in a position to calculate the manner in which our silver iodide will be transmitted upward and dispersed

within cloud systems by the prevailing winds, temperatures, and moisture conditions, in the airstreams affecting our targets. The generators are turned on and off by orders dispatched over the telephone from Denver to operators stationed in or near each project.

I am sure you know that you have quite a few critics. There are a lot of people, in fact, who just don't believe that you or anyone else can make it rain. How do you answer these people?

Through a long series of field experiments conducted in 26 states and in 10 foreign countries, we have amassed about 600,000 hours of operations. By patiently and carefully analyzing the rainfall patterns from the operations we can distinguish the gains in precipitation in our project areas. Rain in the targets is compared to locations upwind behind our generators in the same moisture bearing airstreams that we are seeding for our targets but which pass over these upwind areas without any seeding effects. When the experiments have been carried on for several years the difference in the precipitation patterns between the targets and upwind areas become readily apparent. Currently we are developing a new method of determining our results. On the basis of our long range forecasting techniques, we can predict the upcoming weather before a project begins to determine what the natural rainfall patterns will look like. After the project is completed, the difference between the actually observed rainfall and that which was anticipated, will measure the results of our work.

How much technical acceptance have you gained for "weather engineering"?

A number of independent agencies, such as the National Advisory Committee on Weather Control, are now beginning to confirm cloud seeding results. These efforts will tend to gain public support and more general acceptance of cloud seeding as a new and useful aid to farming.

We'd like to say that this has been a very interesting interview. Now would you care to let yourself go and give us some predictions on the future of the industry?

The field of weather modification is a very new one. We are just beyond the point in our industry that marked the beginning of the aviation industry with Wright Brothers historic flight at Kitty Hawk. Look what has happened in the aircraft industry and air transport in the succeeding 50 years. We think that similar developments will occur in the

field of weather modification. Currently there are a number of companies in this field and their numbers should increase as public acceptance of this new technology grows.

What will all this mean to farmers?

We shall no doubt learn to suppress tornadoes and other violent weather phenomena, to divert treacherous hurricanes, and to in general, modify and smooth out the world weather patterns to a point where floods and drought will be minimized and agriculture can proceed within a planned weather framework which will remove this gamble from farming permanently.

A Farmer's Prayer

By *Samuel R. Guard*

Surely, every seed that we planted was inoculated with the Breath of Heaven, Our Father, so we thank Thee, thank Thee for this burgeoning, bright-green promise of plenty.

We found that lost lamb too, Good Shepherd, and now rejoice in our safely stabled regiment of bleating, grunting, bawling young'uns.

The path to the barn is bordered with blossoms and our hearts are lifted to a tune of peace.

Heal all those hurt lads, Lord, and garland the lonely little mounds in the tortured hills in foreign lands with Thine eternal care.

May we who builded the wall, and bare burdens, and lade, may we drop the sword from the other hand now?

Or is Sanballat not yet done with his craftiness?

Anyway, we will bind up his wounds, set him on our beast, take care of him, and repay, thanks be to Thee.

Amen . . . Amen.

Don't Guess - Test Your Soil

Actual facts and figures tell how one farm got results from fertilizer and lime . . .

Condensed from Pennsylvania Farmer

Murray W. Fisk, County Agent

CAN YOU afford to apply $95 worth of lime and fertilizer per acre over a five-year period to get $750 worth of hay per acre in return?

The following story is true and was taken directly from the record books of Northeastern Pennsylvania Artificial Breeding Cooperative's farm, one of Pennsylvania Agricultural Extension's original soil test pilot farms.

In 1947 and 1948 the average yield of hay on the NEPA farm was slightly over one ton per acre, or a crop worth about $25. The farm's soil was then put through complete tests. Lime and fertilizer were applied as recommended in harmony with soil test results from the Pennsylvania State University soil testing laboratory.

The Cost

How much did it cost? The original cost was about $35 per acre for lime and fertilizer. The farm was then seeded to alfalfa, brome and timothy as rapidly as the soil improvement could be made.

What results did they get? The average yield for the past five years has been four and one-quarter tons per acre of brome and alfalfa—value, about $150 per acre. Each year the fields are top-dressed after removing the first and third cutting, according to soil test results made after removing the first crop. The average cost of maintenance, liming and fertilization has been $15 per acre per year for the entire farm.

Where is the fertility level now, a lot of people ask. Well, the 1956 soil test results show the entire farm needs no lime and no fertilizer besides the maintenance level of 0-20-20 and lime that was mentioned before as costing about $15 per acre per year.

Some folks say indifferently, "That organization has the money to fertilize as suggested and it is different for them to spend

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money than for a farmer." That is exactly why NEPA was used all these years as a pilot farm—to prove beyond a doubt right here in northeastern Pennsylvania that you cannot afford to lime and fertilize crops by guess.

Good Economy

Bill Schaefer, manager of NEPA, has a very accurate yearly record on each field on this farm and can show exactly what has been done each year. Without these records, the averages mentioned before could not have been made. As for the economy of the operation—well, you figure it out. The directors of NEPA are all dairy farmers and they aren't spending any money unless it is fully accounted for.

Soil testing help can be obtained in any county agent's office. It will pay to ask for it.

Of every $15 the federal government spends, one dollar is spent in agricultural programs.

It is more economical to grow four tons of high quality hay on one acre than to use four acres to produce four tons of mediocre hay. Fertilized fields also produce hay of higher mineral and vitamin content.

High Corn Plant Populations Increase Yields

Minnesota's 1956 X-Tra Corn Yield Contest again showed the importance of having a high number of corn plants in each acre.

Charles Simkins and Curtis Overdahl, extension soils specialists, report that on the well-fertilized X-Tra yield plots, farmers who planted 12,000 or less plants per acre had average of 103 bushels per acre.

Where the populations averaged 16-18,000 plants per acre, yields averaged almost 129 bushels per acre.

Fertilized plots with populations of nearly 17,000 plants averaged 52.5 bushels per acre more than fields that had populations of less than 12,000 plants per acre and received no fertilizer.

Until recently, conventional plant populations on most farms averaged about 10-12,000 plants per acre. Now, soils specialists and agronomists recommend up to 18,000 corn plants on each acre.

Planting more than 18,000 plants didn't result in much further increase in the 1956 contest. When there are too many plants per acre, they compete with each other for moisture and plant food.

—University Farm and Home News

Will Our Grasses be Destroyed?

Report on an interesting study of the grasses of the Great Plains and their chances for survival . . .

Condensed from Nebraska Farmer
Bruce Nicoll

TOWERING clouds of dust in the western two-thirds of Nebraska this spring are stern reminders that we sometimes pay heavily for interfering with nature.

Three years of dry weather have opened great areas of cultivated land in Nebraska, and other Great Plains states, to the erosive forces of wind and water.

Less than 60 years ago nearly all of the western two-thirds of Nebraska was part of a vast sweep of grassland extending from the foothills of the Rocky Mountains eastward 400 miles, and ranging from Canada southward nearly to the Rio Grande. This is the Great Plains grassland, one of the most extensive grazing areas in the world.

The climate and man have joined forces, however, to destroy or weaken large areas of this great natural resource, in the opinion of a University of Nebraska scientist who has watched the grassland's struggle for survival much as a doctor watches a very ill patient.

Dr. J. E. Weaver, for nearly 40 years, has intensively studied the Great Plains grasses. A world-famous plant ecologist, Dr. Weaver believes that much of this grassland is in danger of extinction unless man is willing to accept some of the rules nature has laid down through countless centuries of trial and error.

The grasses of the Great Plains had their origins, scientists now believe, about 25,000,000 years ago when the forests which covered the region withdrew as the climate became drier and warmer.

In the intervening years, the grasses and other plants which compose the grasslands, slowly adapted themselves to their environment. When the glaciers moved into the upper third of the Great Plains a million years ago, the g r a s s l a n d s literally moved southward to warmer climates. When the glaciers receded they moved north again.

Dr. Weaver believes that the struggle for existence in the grasslands has resulted in vegetation

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excellently endowed to compete with the dynamic and often violent character of the region's present climate.

Cloudbursts, blizzards, drought, searing heat and intense cold—all common to the Great Plains—come and go. Yet the grasses remain, catching the water and utilizing it immediately, and anchoring the soil against the winds with a thick sod which has been largely instrumental in developing a rich soil.

The Great Plains grasslands are technically described as Mixed Prairie because they are composed of medium height and short grasses and non-grasslike plants called forbs, as opposed to the tall grasses of True Prairie found in eastern Nebraska, and the states lying in part between and beyond the Missouri and Mississippi Rivers.

The Mixed Prairie, Dr. Weaver explains, has not withstood its natural enemies but developed a pattern of harmonious community life. The taller grasses share moisture with the shorter grasses through root systems which are similar in size and extent. Although the lower-growing grasses and forbs receive less sunshine they are less handicapped by grazing.

When the traditionally forest-dwelling white men first came to the Great Plains, the absence of trees prompted some of them to describe the region as desert. But as settlement pushed westward the farmer found a rich soil beneath the tough sod. The cattleman moving up from Texas found in this marvelous prairie what appeared to be an almost inexhaustible supply of feed for livestock.

The white man's plow, of course, destroyed large expanses of grassland in Nebraska, and in the other eleven Great Plains states and Canadian provinces. Similarly, over-grazing seriously weakened and sometimes killed the grasses in additional areas of the region.

The Dutch have overcome the problem of storing surplus butter by freezing cream and making butter from it when needed. They report it tastes like fresh butter and surpasses it in vitamin A content.

The folly of the white man's exploitation of this great natural resource, Dr. Weaver points out, became painfully evident in the early 1930's when the severest drought of record struck the region. Dense clouds of dust billowed out of the "dust bowl," blotting out the sun at noon, and carrying tons of rich topsoil as far eastward as the Atlantic seaboard.

It was at this time that Dr.

Weaver began a systematic observation of the effects of the drought on the Great Plains grasslands.

In 30 large areas of native prairie they observed, through eight years of searing heat, deficient rainfall, drifting sand, and dust storms, the slow destruction of the grasses.

First the taller mid grasses wilted and died. Then the more hardy short grasses wilted and, along with the forbs, began succumbing.

Grass stands became thinned and root systems became shallower as the plants struggled for the meager water supply. More lands died as starving cattle ate anything that grew. Dust suffocated more plants. Weeds became dominant. Finally, in some cases, almost nothing grew.

Most of the vegetation which had covered 95 per cent of the soil in 1930 had been reduced at the end of the drought to five to 20 per cent cover. Some prairies were bare. In some instances, the more drought resistant short grasses had moved eastward as far as 150 miles into the True Prairie transition zone where there was a more favorable water supply.

As the drought drew to a close, Dr. Weaver concluded the grasslands would have withstood the destruction much better if man had not unduly interfered with them.

He found that soil blown in from barren cultivated fields contributed to the death of many prairie pastures. The grasses were covered with a layer of soil ranging from one-half to two inches in depth. Drifts of soil two to three or more feet high were common.

He also found that overgrazed prairies succumbed much more quickly, and basal cover became less than that in prairies moderately grazed or ungrazed.

The drought ended in 1940. As normal rainfall returned, the grasslands vegetation began slow recovery.

First came the least desirable weeds. The second stage was of longer lived weeds. Then came the grasses which slowly pushed out the weeds. Finally came the forbs. The grassland community, aided by the partial absence of grazing herds dissipated by the drought, had been miraculously restored only after three or four years.

Despite man, the native grasses had been able to fight the drought and emerge somewhat shaken but victorious. Abundant rainfall and good soil moisture characterized the prairie in the 1940's, but again man—driven by the anxiety of a world war and the prosperity following it—plowed under much more prairie sod to

produce more wheat. Cattle numbers rose to record proportions and the prairie struggled to provide the necessary forage.

In 1952 drought struck again. It has continued for three and one-half years. In some areas of the Great Plains the destruction of the grass—particularly in the overgrazed ranges — was more rapid than during the thirties. Dr. Weaver and Dr. Albertson are again watching the grasses as they struggle to survive the violence of nature, and the shortsightedness of man.

These scientists are not sure our native grasses can indefinitely survive the hazards created by both nature and man. They believe that poor pasture and range management may eventually so weaken our prairies that drought may wipe them out.

Their experiments show that controlled grazing produces more forage for livestock and keeps the grasses strong enough to provide cover against erosion and to resist the destruction of drought.

Nebraska has 25,000,000 acres of prairie possessing an annual worth of more than $60,000,000. Surely, these scientists argue, this is a resource worth husbanding as carefully as we tend our cultivated crops.

Dr. Weaver and Dr. Albertson of Fort Hays, Kansas State College, believe that our cultivated land must periodically be returned to native grasses because the land is steadily deteriorating. Grasses and accompanying forbs are the only plants which can restore to the soil the nitrogen, organic material and bacterial activity essential to soil fertility. Cultivation gradually exhausts all of these factors.

These scentists believe that the destruction of Nebraska's soil in the Great Plains grassland belt is progressing faster than man's devices to conserve and enrich it.

They believe that the destruction of the grasslands soil by cropping has reduced its productivity at least 40 per cent, and the process still continues.

Looking ahead these two men contemplate sadly a possible final effect of soil depletion and forced abandonment unless a more nearly natural use of land—moderate grazing—is pursued.

SILENT INVASION

When Antoine Pinay, French foreign minister, was shown the new German army equipment recently, he was intrigued by a type of boots with rubber soles.

"The next time," he was overheard muttering, "we won't even hear them coming!" —From La Voz de Espana, San Sebastian, Spain

FARM BOOK REVIEWS

Fundamentals of Horticulture

By J. B. Edmond, A. M. Musser and F. S. Andrews, all professors of horticulture. Published by McGraw-Hill Book Company, 330 West 42nd Street, New York 36, New York. 456 pages. Illustrated. Second edition. $6.75

A textbook designed for courses in general horticulture at the college level. Also should be an excellent text and reference book for the practical fruit grower. Presents a balanced view of the whole field, shows the influence of environment on the growth, development and yield of horticultural crops. First section covers the fundamentals of plant growth such as temperature, light, water, etc. The second and more practical section covers the practices of propagating, pruning, controlling pests, etc. The third and last section contains eight chapters, each on a different type of fruit or crop.

How To Have a Green Thumb Without an Aching Back

By Ruth Stout. Published by Exposition Press Inc., 386 Fourth Avenue, New York 16, N. Y. Third edition. 164 pages. Not illustrated. $2.75.

Describes a new method of mulch gardening. Written by and for people who are obviously and unashamedly home gardeners. In easy reading, folksy style the author tells of her experience in developing a system of mulch gardening. Not much here for the practical farmer unless he also is a hobby gardener.

Vegetable Growing

Published in England. By Fred W. Loads. 1956. One of the Foyles Handbook Series popular in England. Hard paper cover. 96 pages. Illustrated. Distributed in this country by Dover Publications, 920 Broad Street, New York City 10. 75 cents.

For Island conditions many of which may be duplicated in this country, this book tells about Common and Uncommon Vegetables, Manures and Manuring, Growing for Exhibition, Salads, Herbs and Greenhouses. Use to supplement books you may have.

Snakes and Snake Hunting

By Carl Kauffeld. Published by Doubleday & Company, 575 Madison Avenue, New York City 22. 266 pages. Illustrated. $3.95.

A noted snake hunter tells of the many snakes of the United States, including over forty venomous forms, and his own adventures in capturing them alive. Covers trips from Okeechobee in Florida to Duchess County, New York. Interesting reading for the farm naturalist.

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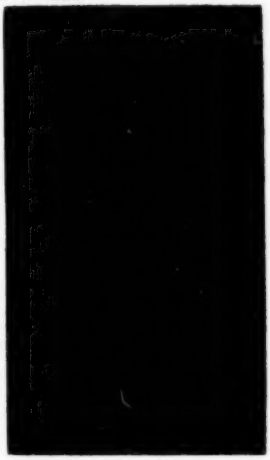

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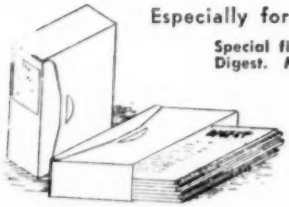

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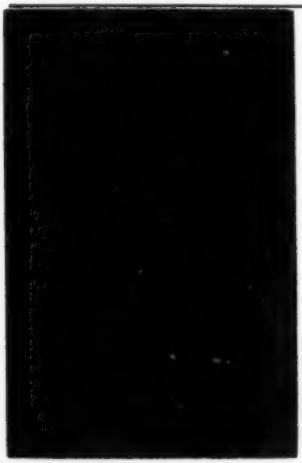

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